MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The REVIEW for February, 1897, is based on 2,764 reports from stations occupied by regular and voluntary observers, classified as follows: 142 from Weather Bureau stations; numerous special river stations; 33 from post surgeons, received through the Surgeon General, U. S. Army; 2,547 from voluntary observers; 96 received through the Southern Pacific Railway Company; 14 from Life-Saving stations, received through the Superintendent United States Life-Saving Service; 32 from Canadian stations; 1 from Hawaii; 20 from Mexican stations. International simultaneous observations are received from a few stations and used together with trustworthy newspaper extracts and special reports.

The WEATHER REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe. Unless otherwise specifically noted, the text is written by the Editor, but the meteorological tables contained in the last section are furnished by Mr. A. J. Henry, Chief of the Division of Records and Meteorological Data. Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada, Mr. Curtis J. Lyons, Meteorologist to the Government Survey, Honolulu, and Dr. Mariano Bárcena, Director of the Central Meteorological Observatory of Mexico.

CLIMATOLOGY OF THE MONTH.

GENERAL CHARACTERISTICS.

The month was generally slightly warmer than the normal; the principal deficits were on the southern Plateau and the northern Slope. The rain and snowfall was generally in excess in the south Atlantic and east Gulf States, and on the Pacific Coast, but deficient over the Lake Region, New England, and the Mississippi Valley. The snowfall was abundant and well preserved so that east of the Rocky Mountains it was deeper than usual at the close of the month. The barometric pressure was everywhere deficient, except in New England and the St. Lawrence Valley. Notable river floods were reported in the Ohio and elsewhere.

ATMOSPHERIC PRESSURE.

[In inches and hundredths.]

The distribution of mean atmospheric pressure reduced to sea level, as shown by mercurial barometers, not reduced to standard gravity, and as determined from observations taken daily at 8 a. m. and 8 p. m. (seventy-fifth meridian time), is shown by isobars on Chart IV. That portion of the reduction to standard gravity that depends on latitude is shown by the numbers printed on the right-hand border.

The *mean pressures* during the current month were high throughout the Atlantic States, and highest over the Rocky Mountain Plateau Region. They were low in the extreme northeastern and northwestern portions of the United States; they were lowest in the Canadian Provinces, Newfoundland, and British Columbia. The reduced pressures were highest: In the United States, Idaho Falls and Salt Lake City, 30.14; Carson City, 30.13; Harrisburg, 30.12; San Luis Obispo, Huron, Northfield, Lynchburg, Atlanta, Charleston, Tampa, Jupiter, and Key West, 30.11; in Canada, White River, 30.14; Winnipeg, Minnedosa, and Battleford, 30.10. The lowest were: In the United States, Tatoosh Island, 29.91; Fort Canby, 29.92; Portland, Oreg., 29.97; Spokane, 29.99; in Canada, St. Johns, N. F., 29.73; Esquimault, 29.91; Sydney, 29.94.

As compared with the normal for February, the mean pressure was in excess in New England and the St. Lawrence Valley; elsewhere it was deficient. The greatest excesses were: In the United States, Eastport, 0.07; Northfield, 0.05; Albany, 0.04; in Canada, White River, 0.06; Charlottetown, 0.05; Father Point and Halifax, 0.04. The greatest deficits were: United States, Havre and Rapid City, 0.14; Pueblo, 0.13; Spokane and Miles City, 0.12; Tatoosh Island, Roseburg, and Walla Walla, 0.11; Canada, St. Johns, N. F., 0.19; Medicine Hat, 0.12; Swift Current, 0.09; Calgary and Qu'Appelle, 0.07.

As compared with the preceding month of January, the pressures reduced to sea level show a rise over New England, Ontario, and Quebec and a fall over Newfoundland and the rest of Canada and the United States. The greatest rises were: United States, Sault Ste. Marie, 0.04; Northfield, Eastport, and Portland, Me., 0.03; Canada, Father Point, 0.08; Quebec, 0.05; Chatham and White River, 0.04. The greatest falls were: United States, Lander, 0.27; Helena, 0.25; Walla Walla, 0.24; Spokane, 0.23; Abilene, 0.22; Pueblo, Amarillo, and Oklahoma, 0.21; Canada, Kamloops, 0.26; Banff, 0.21; Medicine Hat, 0.19; Edmonton, 0.18.

AREAS OF HIGH AND LOW PRESSURE.

By Prof. H. A. HAZEN.

During the month the tracks of eight highs and eleven lows have been sufficiently defined to be mapped (see Charts I and II). The accompanying table presents the principal facts regarding the place of origin and disappearance of these highs and lows.

In general the highs have taken a rather high latitude or

else have followed nearly the same path through the center of the country (see Chart I). No. V began in the middle Plateau Region, and No. VIII off the north Pacific Coast; all the other highs originated, or were first seen, to the north of Montana or Lake Superior. No. III was last noted in the middle St. Lawrence Valley, I and VI near Newfoundland, and all the rest near the middle Atlantic Coast.

The lows were much more uniformly distributed over the country than the highs (see Chart II). No. III was first noted off the north Pacific Coast, and VIII off the middle Pacific; IV and VI were first noted in Arizona, and I, II, IX, and X north of the Gulf of Mexico; V, VII, and XI were first noted to the north of Montana. The common locus of nearly all was over or near Newfoundland. Nos. I and III disappeared off or near the middle Atlantic Coast, and IX in the middle St. Lawrence Valley.

Highest temperatures during the third decade of February were recorded during the passage of low No. IX.

High winds of 70 miles per hour at Block Island occurred p. m. of 3d as low No. I passed off the Atlantic Coast. Winds of 60 miles per hour were reported p. m. of 6th from New York as low No. II passed toward the Atlantic. The remaining storms of the month were of slight intensity. As No. II approached the Atlantic the heaviest precipitation of the month was reported, 3.24 inches in twenty-four hours, at Augusta, and 3.10 inches at Tampa, a. m. of the 6th.

The lowest temperature of the third decade of February was reported on the 26th during the passage of high area No. VIII.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	*Miles.*	*Days.*	*Miles.*	*Miles.*
I	1, p. m.	52	94	7, a. m.	52	56	2,270	5.5	413	17.2
II	5, a. m.	54	116	9, p. m.	40	80	2,120	4.5	471	19.6
III	8, a. m.	50	99	12, a. m.	47	71	1,360	4.0	340	14.2
IV	12, p. m.	52	89	14, a. m.	38	73	1,190	1.5	793	33.0
V	16, p. m.	42	119	20, p. m.	41	69	2,630	4.0	658	27.4
VI	19, a. m.	54	109	23, a. m.	48	61	2,340	4.0	560	23.3
VII	22, a. m.	49	111	24, p. m.	37	74	2,320	2.5	929	38.7
VIII	24, p. m.	47	126	28, a. m.	37	78	2,990	3.5	855	35.6
Total							17,120	29.5	5,019	
Mean of 8 tracks							2,140	3.7	627	26.1
Mean of 29.5 days									580	24.2
Low areas.										
I	1, a. m.	32	86	2, p. m.	37	73	830	1.5	548	22.8
II	2, p. m.	38	103	9, a. m.	47	60	3,270	6.5	503	21.0
III	3, p. m.	47	127	8, a. m.	38	82	3,350	4.5	744	31.0
IV	8, a. m.	34	113	13, a. m.	48	56	3,700	5.0	740	30.8
V	10, p. m.	53	113	15, a. m.	49	61	3,210	4.5	713	29.7
VI	13, a. m.	35	113	17, a. m.	49	56	3,530	4.0	882	36.8
VII	14, p. m.	53	118	20, a. m.	45	57	3,210	5.5	584	24.3
VIII	18, p. m.	40	124	22, a. m.	50	56	3,380	3.5	965	40.2
IX	20, p. m.	36	99	23, p. m.	48	73	1,810	3.0	603	25.1
X	22, a. m.	36	91	24, a. m.	47	56	1,070	2.0	987	41.1
XI	23, a. m.	53	111	26, a. m.	45	59	2,990	3.0	998	41.6
Total							31,240	43.0	8,267	
Mean of 11 tracks							2,840	3.9	752	31.3
Mean of 43 days									727	30.3

TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

The mean temperature is given for each station in Table II, for voluntary observers. Both the mean temperatures and the departures from the normal are given in Table I for the regular stations of the Weather Bureau, which also gives the height of the thermometers above the ground at each station.

The *monthly mean temperatures* published in Table I, for the regular stations of the Weather Bureau, are the simple means of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

The *regular diurnal period* in temperature is shown by the hourly means given in Table V for 29 stations selected out of 82 that maintain continuous thermograph records.

The *distribution of the observed monthly mean* temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart IV; the lines are drawn over the Rocky Mountain Plateau region, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

The *highest mean temperatures* were: Key West, 72.7; Jupiter, 69.4; Tampa, 65.2; Corpus Christi, 61.4; Jacksonville, 60.0; in Canada, Esquimault, 40.0; Kamloops, 29.2; Port Stanley, 25.0; Toronto, 24.6; Saugeen, 21.7. The lowest were: Williston, 6.3; Bismarck, 6.6; Moorhead, 7.8; Huron, 10.4; Havre, 11.2; in Canada, Prince Albert, —2.4; Battleford, —1.6; Minnedosa, —1.3; Winnipeg, —0.3.

As compared with the normal for February the mean temperature for the current month was in excess over the Lake Region, New England, the Mississippi and Missouri valleys, the northern Plateau and north Pacific Slope. It was deficient in the Southern Plateau and south Pacific Slope, the central Gulf and upper Missouri. The greatest excesses were: In the United States, Idaho Falls, 8.3; Greenbay, 6.2; Duluth, 5.6; Alpena, 5.5; Marquette, 5.4; in Canada, Port Arthur, 5.9; Port Stanley, 5.2; Calgary, 5.1. The largest deficits were: Carson City, 5.5; Port Eads, 4.5; Havre, 3.7; Canada: St. Johns, N. F., 2.4; Charlottetown, 1.1.

Considered by districts the mean temperatures of the current month show departures from the normal as given in Table I. The greatest positive departures were: Upper Lake, 4.2; northern Plateau, 5.4. The greatest negative departures were: Southern Plateau, 1.6; middle Plateau, 3.3.

The years of highest and lowest mean temperatures for February are shown in Table I of the REVIEW for February, 1894. The mean temperature for the current month was the highest on record at: Abilene, 51.8; Baker City, 29.6; Greenbay, 23.2. The mean temperature was the lowest on record only at Carson City, 30.1.

The *maximum and minimum temperatures* of the current month are given in Table I. The highest maxima were: 86, Jupiter (25th); 85, Abilene (17th) and San Antonio (18th); 84, Jacksonville and Corpus Christi (22d); 83, Los Angeles (26th) and Yuma (28th). The lowest maxima were: 32, Williston (frequently); 33, Bismarck (16th) and Moorhead (20th); 34, Duluth (20th); 36, Sault Ste. Marie (3d), St. Paul (13th), and Duluth (20th). The highest minima were: 58, Key West (4th); 46, Jupiter (3d); 39, Tampa (28th); 38, San Francisco (20th), San Diego (22d), and Charleston (28th). The lowest minima were: —30, Moorhead (26th); —25, Williston, Bismarck, and Huron (26th); —22, St. Paul (26th); —21, Minneapolis and Sault Ste. Marie (26th).

The *limits of minimum temperatures*, 32° and 40°, are shown by lines on Chart No. V.

The *years of highest maximum and lowest minimum temperatures* for February are given in the last four columns of Table I of the REVIEW for 1896. During the current month the maximum temperatures were equal to or above the highest on record at: Abilene, 85; Palestine and Fort Smith, 82; Shreveport, 81; Little Rock, 78. The minimum temperatures were equal to or below the lowest on record only at: Carson City, —14.

The *greatest daily range of temperature and the data for computing the extreme and mean monthly ranges* are given for each of the regular Weather Bureau stations in Table I. The

largest values of the greatest daily ranges were: Miles City, 51; Carson City, 48; Pueblo, 47; Havre, Williston, Bismarck, Sioux City, and Northfield, 46. The smallest values were: Tatoosh Island, 12; Point Reyes Light, Nantucket, and Block Island, 14; Key West, 15; East Clallam, 16.

Among the *extreme monthly ranges* the largest were: Carson City, 72; Omaha and Lincoln, 70; Sioux City, 65; Columbus, Mo., 64; Moorhead, Huron, and Pueblo, 63; Des Moines, Springfield, Fort Smith, and Nashville, 62; Dodge City, 61; Rapid City and Springfield, Ill., 60. The smallest values were: Tatoosh Island, 18; Seattle, 20; Point Reyes Light, 22; Pysht, Astoria, and Key West, 24; Port Angeles and Woods Hole, 25; Fort Canby, Block Island, and Nantucket, 26.

Accumulated monthly departures from normal temperatures from January 1 to the end of the current month are given in the second column of the following table, and the average departures are given in the third column for comparison with the departures of current conditions of vegetation from the normal condition.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Total.	Average.		Total.	Average.
	°	°		°	°
New England	+ 1.6	+ 0.8	Middle Atlantic	— 1.7	— 0.8
West Gulf	+ 1.6	+ 0.8	South Atlantic	— 2.8	— 1.4
Lower Lake	+ 0.5	+ 0.2	Florida Peninsula	— 0.5	— 0.2
Upper Lake	+ 6.7	+ 3.4	East Gulf	— 3.3	— 1.6
North Dakota	+ 2.8	+ 1.4	Ohio Valley and Tenn.	— 0.9	— 0.4
Upper Mississippi Valley	+ 3.8	+ 1.9	Southern Plateau	— 1.3	— 0.6
Missouri Valley	+ 7.7	+ 3.8	Middle Plateau	— 0.3	— 0.2
Northern Slope	+ 4.4	+ 2.2	Middle Pacific	— 0.5	— 0.2
Middle Slope	+ 2.8	+ 1.4			
Southern Slope	+ 0.4	+ 0.2			
Northern Plateau	+ 9.6	+ 4.8			
North Pacific	+ 3.0	+ 1.5			
South Pacific	+ 0.4	+ 0.2			

MOISTURE.

The *quantity of moisture* in the atmosphere at any time may be expressed by the weight of the vapor coexisting with the air contained in a cubic foot of space, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-point for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, is given in Table I.

The *rate of evaporation* from a special surface of water on muslin at any moment determines the temperature of the wet-bulb thermometer. The mean wet-bulb temperature is now published in Table I; it is always intermediate, and generally about half way between the temperature of the air and of the dew-point. The quantity of water evaporated from the muslin surface may be considered as depending essentially upon the wet-bulb temperature, the dew-point, and the wind.

The *relative humidity*, or the ratio between the moisture that is present in the air and the moisture that it would contain if saturated at its observed temperature is given in Table I as deduced from the 8 a. m. and 8 p. m. observations. The general average for a whole day or any other interval would properly be obtained from the data given by an evaporometer, but may also be obtained, approximately, from frequent observations of the relative humidity.

PRECIPITATION.

[In inches and hundredths.]

The *distribution of precipitation* for the current month, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III. The total precipitation for the current month exceeded 10 inches on the immediate coast of northern California, Washington, and Oregon, and was between 10 and 20 inches at high stations on the Sierra Nevada. An average of 3 inches fell over New England, and from 4 to 10 inches over the Middle and South Atlantic States. From 8 to 12 inches fell in western Florida and southern Louisiana, Mississippi, and Alabama. The larger for regular stations were: Astoria, 12.89; Eureka, 11.23; Tatoosh Island, 11.16; Pensacola, 10.26; Fort Canby, 10.24. Canada: St. Johns, N. F., 5.85.

Details as to *excessive precipitation* for February are given in Tables XI and XII.

The *years of greatest and least precipitation* for February are given in the REVIEW for February, 1890. The precipitation for the current month was the greatest on record at: Astoria, 12.89; Pensacola, 10.26; Columbia, S. C., 9.11; Augusta, 8.57; Lynchburg, 7.84; Kittyhawk, 7.72; Parkersburg, 7.04; Tampa, 5.40; Jupiter, 5.14; Carson City, 4.30; Salt Lake City, 3.87; Fresno, 2.65; Dodge City, 2.38; Pueblo, 1.47; Williston, 1.10. It was the least on record at: Abilene, 0.02; Corpus Christi, 0.06; San Antonio, 0.15; Palestine, 0.29.

The *diurnal variation*, as shown by tables of hourly means of the total precipitation, deduced from self-registering gauges kept at the regular stations of the Weather Bureau, is not now tabulated.

The *current departures* from the normal precipitation are given in Table I, which shows that precipitation was in excess throughout the South Atlantic and east Gulf States, as well as, to a less extent, over the Rocky Mountain Plateau region. It was decidedly in excess on the Pacific Coast. It was deficient in the Mississippi and lower Missouri valleys and the Lake Region. The large excesses were: Pensacola, 6.4; Savannah, 5.8; Astoria, 5.2; Eureka, 5.1; Columbia, S. C., 4.9; in Canada, Port Stanley, 0.3; Swift Current and Qu'Appelle, 0.1. The large deficits were: Shreveport, 3.7; Little Rock, 3.6; Fort Smith, 3.2; in Canada, Yarmouth, 3.5; Charlottetown, 2.1; Quebec, 1.4.

The *average departure* for each district is given in Table I. By dividing each current precipitation by its respective normal the following corresponding percentages are obtained (precipitation is in excess when the percentage of the normal exceeds 100):

Above the normal: Middle Atlantic, 121; south Atlantic, 188; Florida Peninsula, 163; east Gulf, 127; Ohio Valley and Tennessee, 114; North Dakota, 215; northern Slope, 138; middle Slope, 162; middle Plateau, 240; northern Plateau, 134; north Pacific, 122; middle Pacific, 151; south Pacific, 169.

Below the normal: New England, 64; west Gulf, 22; lower Lake, 60; upper Lake, 80; upper Mississippi, 84; Missouri Valley, 86; southern Slope, 25; southern Plateau, 67.

The *total accumulated monthly departures* from January 1 to the end of the current month are given in the second column of the following table: The third column gives the percentage of the current accumulated precipitation relative to its normal value.

Districts.	Accumulated departures.	Accumulated precipitation.	Districts.	Accumulated departures.	Accumulated precipitation.
	Inches.	*Per ct.*		*Inches.*	*Per ct.*
South Atlantic	+ 1.00	113	New England	— 1.70	78
Florida Peninsula	+ 0.70	110	Middle Atlantic	— 1.00	86
North Dakota	+ 1.00	172	East Gulf	— 0.60	94
Upper Mississippi Valley	+ 1.50	142	West Gulf	— 1.60	77
Missouri Valley	+ 1.50	200	Ohio Valley and Tenn.	— 0.90	89
Middle Slope	+ 0.60	136	Lower Lake	— 1.10	80
Southern Plateau	+ 1.30	213	Upper Lake	— 1.10	82
Middle Plateau	+ 1.20	140	Northern Plateau	— 0.40	90
South Pacific	+ 2.30	154	North Pacific	— 0.70	95
Northern Slope	0.00	100	Middle Pacific	— 0.50	95
Abilene (southern Slope)	0.00	100			

SNOWFALL.

The *total monthly snowfall* at each station is given in Tables I and II; its geographical distribution is shown on Chart V. This chart also shows the isotherms of minimum 32° and of minimum 40° for the air within the ordinary thermometer shelter. The former isotherm is an approximate limit to possible snow, while the latter is an approximate southern limit to the regions that report frost in exposed localities.

Snowfalls of from 10 to 20 inches were reported from New England and the hilly portions of the Middle Atlantic States; from 5 to 15 inches prevailed over the Lake Region, the upper Mississippi and lower Missouri valleys. Heavy snowfall occurred in the Rocky Mountain and Sierra Nevada ranges, the heaviest reported were 239 inches at Ruby, Colo., 102 at Cisco, Cal., and 112 at Cascade Tunnel, Wash.

On the February weather map of the Canadian service the director, Prof. R. F. Stupart, says: "The precipitation throughout Canada was everywhere below the average."

The *depth of snow on the ground* at the end of the month is given in detail in Table II, and for the winter months is shown on Chart VI; it is also given on the weekly charts of the Climate and Crop Service, published by the Weather Bureau during December to March, inclusive.

In general, at the close of the month there was about 15 to 20 inches in the interior of New England, central New York, upper Michigan; 15 to 35 in western Wisconsin, southern Minnesota; 25 to 50 in northern Minnesota and the eastern portions of North and South Dakota. Heavy snow also lay on the mountains of Colorado, California, Nevada, Idaho, Washington and Oregon.

"In British Columbia the depth is at most points less than at the same date last year: Barkerville, 20 inches; Glacier House, 72; Revelstoke, 36; Donald, 36; from Kamloops to the coast, along the line of the Canadian Pacific, none. In the Northwest Territories, last year, there was only a thin coating on the prairies, but this year the amount was very considerable, Edmonton and Battleford, 16 inches on the level, and Qu'Appelle, 29; in Manitoba the amount is much greater than a year ago, Minnedosa, 34 inches on a level; Winnipeg, 18. In the Lake Superior district the amount is about the same as it was last year, but from Lake Huron eastward somewhat less, except in the extreme portions of Ontario and the Maritime Provinces, where it is slightly greater."

ICE.

The *thickness of ice* in the rivers and harbors is shown in detail in the bulletins published every Monday by the Weather Bureau, and is also given in some detail in the chapter on "River and Flood Service." The more prominent characteristic data for the first and last Mondays, February 1 and 22, respectively, are:

Connecticut, Middletown, 6 and 4 inches; Iowa; Dubuque, 13 and 9, Sioux City, 19 and 19; Maine, Bangor, 16.5 and 21.5, Eastport, 18 and 15, Gardiner, 14.6 and 15.0, Lewiston, 20 and 21; Massachusetts, Concord, 14 and 10; Michigan, Alpena, 6 and 2, Detroit, 11 and 12, Port Huron, 10 and 7, Sault Ste. Marie, 9.5 and 15.0; Minnesota, Duluth, 24.0 and 24.5, Moorhead, 28 and 30, St. Paul, 23 and 20; Nebraska, Omaha, 11.0 and 7.5, Valentine, 21 and 19; New York, Albany, 10 and 8, Oswego, 15.5 and 17.0, Rochester, 9.5 and 11; North Dakota, Bismarck, 33 and 33, Williston, 24 and 34; Ohio, Cleveland, 9 and 6, Sandusky, 10 5; Pennsylvania, Erie, 10 and 11; South Dakota, Pierre, 20.0 and 22.5, Yankton, 20 and 22; Vermont, Brattleboro, 12.5 and 5.0; Wisconsin, Greenbay, 10.5 and 8.5, La Crosse, 13.0 and 7.5.

The ice broke up as follows: Connecticut River, Brattleboro, Vt., February 8; Missouri River, Hermann, Mo., February 8; Susquehanna River, Harrisburg, Pa., February 7, and Columbia, February 8.

Up to February 23, the ice harvest was good or excellent at Lewiston, Me., Dubuque and Sioux City, Iowa, and Harrisburg, Pa., and above Albany, N. Y.

In Canada.—Prof. R. F. Stupart publishes the following reports of the thickness of ice at the close of the month:

Northwest Territories, Battleford, 24 inches; Swift Current, 28; Regina, 30. Ontario, Port Arthur, 30 inches; Parry Sound, 15; Southampton, 23; Port Stanley, 10; Kingston, 15; Port Dover, 13; Stony Creek, 11; Orillia, 18; Lakefield, 20; Welland, 18; Midland, 17; Mattawa, 22; Smiths Falls, 16; Bayfield, 24; Sparrow Lake, 21; Clontarf, 30. Maritime Provinces, Chatham, 22 inches; St. Andrews, 32; Pictou, 18; Sydney, 12; Charlottetown, 12; Fredericton, 30.

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 22. Arizona, 7, 9, 21. Arkansas, 1, 7, 22, 28. California, 1, 2, 11, 15, 18, 19, 20. Georgia, 1, 5. Illinois, 20, 21. Indiana, 20. Kansas, 21. Kentucky, 18 to 22. Louisiana, 1, 11, 15. Mississippi, 7, 12, 22. Missouri, 19 to 22, 25. Oklahoma, 3, 20. Oregon, 2, 8, 12, 13, 16, 17, 19, 20. South Carolina, 8, 13, 14, 17. Tennessee, 22. Texas, 3, 10. Washington, 7, 11, 12, 16, 20. West Virginia, 22.

SLEET.

The following are the dates on which sleet fell in the respective States:

Arizona, 12, 20, 21. Arkansas, 1, 3. California, 1, 2, 3, 14, 15, 17 to 21, 28. Colorado, 21. Connecticut, 3, 8, 15, 16, 20, 22, 23. District of Columbia, 2, 3, 8, 11, 12, 18, 20. Georgia, 1, 4, 25. Idaho, 4, 5, 10, 15, 16. Illinois, 1, 4, 5, 7, 8, 19 to 22, 28. Indiana, 1, 5, 11, 15, 20, 21, 22. Iowa, 3, 9, 10, 20, 21. Kansas, 3, 10, 11, 13, 21. Kentucky, 1, 2, 4, 8, 18, 26, 28. Louisiana, 23. Maine, 7, 14, 18. Maryland, 2 to 6, 11, 12, 20, 25. Massachusetts, 22, 23. Michigan, 5, 8, 11, 20, 21, 22. Minnesota, 3, 5, 13, 19, 20. Mississippi, 1, 4, 23, 24. Missouri, 3, 4, 5, 7 to 11, 14, 15, 20, 21, 22, 24, 25. Montana, 4, 12, 28. Nebraska, 6, 9, 10, 13, 14, 19, 20, 21, 28. Nevada, 1 to 5, 11, 12, 16. New Hampshire, 22, 23. New Jersey, 2, 3, 6, 8, 12, 15, 16, 20, 23. New York, 2, 6, 12, 15, 16, 20, 22, 23. North Carolina, 1, 2, 5, 20, 25. North Dakota, 3, 5, 15. Ohio. 1, 2, 5, 6, 8, 12, 14, 15, 18 to 22. Oklahoma, 4. Oregon, 2, 3, 11, 12, 15, 16, 20. Pennsylvania, 1, 2, 3, 5, 6, 11, 12, 14, 15, 16, 19 to 23. South Carolina, 1, 25 to 28. South Dakota, 3, 5, 9, 10, 11. Tennessee, 2, 4, 15, 18, 25, 26. Texas, 11. Utah, 1, 2, 12, 17, 19. Vermont, 16, 22. Virginia, 1, 2, 5, 6, 7, 11, 12, 18, 20, 21, 22, 26. Washington, 1, 2, 4 to 7, 10 to 13, 15 to 18, 21. West Virginia, 3, 5, 6, 11, 12, 18, 19, 20, 22. Wisconsin, 3, 5, 13, 20.

WIND.

The *prevailing winds* for February, 1897, viz, those that were recorded most frequently, are shown in Table I for the regular Weather Bureau stations.

The *resultant winds*, as deduced from the personal observations made at 8 a. m. and 8 p. m., are given in Table VIII. These latter resultants are also shown graphically on Chart IV, where the small figure attached to each arrow shows the number of hours that this resultant prevailed, on the assumption that each of the morning and evening observations represents one hour's duration of a uniform wind of average velocity. These figures indicate the relative extent to which winds from different directions counterbalanced each other.

HIGH WINDS.

Maximum wind velocities are given in Table I, which also gives the altitudes of the Weather Bureau anemometers above the ground. Maxima of 50 miles or more per hour were reported during this month at regular stations of the Weather Bureau as follows (maximum velocities are averages for five

minutes; extreme velocities are gusts of shorter duration, and are not given in this table):

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Miles				*Miles*	
Amarillo, Tex	21	52	w.	Fort Canby, Wash.	7	52	se.
Atlantic City, N. J.	2	52	ne.	Havre, Mont.	16	54	sw.
Block Island, R. I	2	57	e.	Huron, S. Dak	19	50	se.
Do	3	70	ne.	Jupiter, Fla	5	51	se.
Do	12	60	ne.	Kittyhawk, N. C.	3	60	n.
Buffalo, N. Y.	14	50	sw.	New Haven, Conn.	6	56	e.
Do	23	59	w.	New York, N. Y	6	60	e.
Do	27	54	w.	San Antonio, Tex	23	60	n.
Charleston, S. C	6	56	se.	Tatoosh Island, Wash.	11	54	nw.
Chicago, Ill	21	51	e.	Do	15	60	w.
Cleveland, Ohio	23	57	w.	Williston, N. Dak	16	60	nw.
El Paso, Tex	6	57	sw.	Winnemucca, Nev.	5	50	sw.
Do	19	56	sw.				

SUNSHINE AND CLOUDINESS.

The quantity of sunshine, and therefore of heat, received by the atmosphere as a whole is very nearly constant from year to year, but the proportion received by the surface of the earth depends upon the absorption by the atmosphere, and varies largely with the distribution of cloudiness. The sunshine is now recorded automatically at 22 regular stations of the Weather Bureau by its photographic, and at 36 by its thermal effects. At one of these stations records are kept by both methods. The photographic record sheets show the apparent solar time, but the thermometric records show seventy-fifth meridian time; for convenience the results are all given in Table X for each hour of local mean time. In order to complete the record of the duration of cloudiness these registers are supplemented by special personal observations of the state of the sky near the sun in the hours after sunrise and before sunset, and the cloudiness for these hours has been added as a correction to the instrumental records, whence there results a complete record of the duration of sunshine from sunrise to sunset.

The average cloudiness of the whole sky is determined by numerous personal observations at all stations during the daytime, and is given in the column "average cloudiness" in Table I; its complement, or percentage of clear sky, is given in the last column of Table X.

Difference between instrumental and personal observations of sunshine.

Stations.	Apparatus.	Total possible duration for the whole month.	Personal estimated area of clear sky.	Instrumental record of sunshine.			
				Photographic.	Difference.	Thermometric.	Difference.
		H'rs.	%	h	h	h	h
Tampa, Fla	T.	314.1	58	.....	.....	63	+ 5
Galveston, Tex	P.	313.1	45	50	+ 5	.....	.....
New Orleans, La	T.	312.1	24	.....	.....	24	0
Savannah, Ga	P.	309.8	35	34	− 1	.....	.....
Vicksburg, Miss	T.	309.8	52	.....	.....	54	+ 2
Charleston, S. C	T.	308.3	43	.....	.....	43	0
Phœnix, Ariz.	P.	308.3	63	70	+ 7	.....	.....
San Diego, Cal	P.	308.3	54	67	+13	.....	.....
Atlanta, Ga	T.	307.1	38	.....	.....	36	− 2
Los Angeles, Cal	P.	307.1	58	65	+ 7	.....	.....
Wilmington, N. C.	T.	307.1	46	.....	.....	50	+ 4
Chattanooga, Tenn	T.	305.8	35	.....	.....	31	− 4
Little Rock, Ark.	T.	305.8	33	.....	.....	49	+16
Nashville, Tenn.	T.	305.0	40	.....	.....	46	+ 6
Raleigh, N. C.	T.	305.0	40	.....	.....	53	+13
Santa Fe, N. Mex.	P.	305.0	46	60	+14	.....	.....
Fresno, Cal.	T.	303.3	50	.....	.....	58	+ 8
Dodge City, Kans.	P.	302.3	54	58	+ 4	.....	.....
Louisville, Ky	T.	302.3	28	.....	.....	38	+10
San Francisco, Cal.	T.	302.3	43	.....	.....	51	+ 8
Atlantic City, N. J.	P.	300.8	38	45	+ 7	.....	.....
Baltimore, Md.	T.	300.8	33	.....	.....	40	+ 7
Cincinnati, Ohio	T.	300.8	34	.....	.....	36	+ 2
Kansas City, Mo.	P.	300.8	30	34	+ 4	.....	.....
St. Louis, Mo	T.	300.8	30	.....	.....	48	+18

Difference between instrumental and personal observations.—Cont'd.

Stations.	Apparatus.	Total possible duration for the whole month.	Personal estimated area of clear sky.	Instrumental record of sunshine.			
				Photographic.	Difference.	Thermometric.	Difference.
		H'rs.	%	h	h	h	h
Washington, D. C.	P.	300.8	39	44	+ 5	.....	.....
Columbus, Ohio	T.	299.7	22	.....	.....	31	+ 9
Denver, Colo.	P.	299.7	50	59	+ 9	.....	.....
Indianapolis, Ind	T.	299.7	36	.....	.....	52	+16
Philadelphia, Pa.	T.	299.7	36	.....	.....	58	+22
Cheyenne, Wyo	P.	298.4	42	55	+13	.....	.....
Eureka, Cal.	P.	298.4	34	35	+ 1	.....	.....
New York, N. Y.	T.	298.4	36	.....	.....	55	+19
Omaha, Nebr.	P.	298.4	34	45	+11	.....	.....
Pittsburg, Pa.	T.	298.4	34	.....	.....	38	+ 4
Salt Lake City, Utah	P.	298.4	17	32	+15	.....	.....
Binghamton, N. Y	T.	296.5	30	.....	.....	35	+ 5
Boston, Mass	T.	296.5	49	.....	.....	54	+ 5
Chicago, Ill	T.	296.5	29	.....	.....	31	+ 2
Cleveland, Ohio	T.	296.5	18	.....	.....	30	+ 2
Des Moines, Iowa	T.	296.5	35	.....	.....	38	+ 3
Detroit, Mich.	T.	296.5	24	.....	.....	34	+10
Dubuque, Iowa	T.	296.5	36	.....	.....	29	− 7
Albany, N. Y. *	T.	295.4	36	.....	.....	59	+23
Buffalo, N. Y	T.	295.4	23	.....	.....	34	+11
Idaho Falls	T.	295.4	17	.....	.....	43	+26
Rochester, N. Y	T.	295.4	25	.....	.....	28	+ 3
Northfield, Vt	P.	293.8	34	47	+13	.....	.....
Portland, Me	T.	293.8	50	.....	.....	66	+16
Eastport, Me.	P.	291.9	50	58	+ 8	.....	.....
Minneapolis, Minn †	T.	291.9	.....	.....	.....	28	.....
St. Paul, Minn.	P.	291.9	25	25	0	.....	.....
Portland, Oreg	T.	290.4	29	.....	.....	25	− 4
	P.	290.4	29	.....	.....	21	− 8
Bismarck, N. Dak.	P.	288.7	43	53	+10	.....	.....
Helena, Mont.	P.	288.7	39	41	+ 2	.....	.....
Seattle, Wash	T.	286.8	28	.....	.....	32	+ 4
Spokane, Wash	P.	286.8	36	29	+ 3	.....	.....

COMPARISON OF DURATIONS AND AREAS.

The sunshine registers give the *durations* of effective sunshine whence the durations relative to possible sunshine are derived; the observers' personal estimates give the percentage of *area* of clear sky. These numbers have no necessary relation to each other, since stationary banks of clouds may obscure the sun without covering the sky, but when all clouds have a steady motion past the sun and are uniformly scattered over the sky, the percentages of duration and of area agree closely. For the sake of comparison, these percentages have been brought together, side by side, in the following table, from which it appears that, in general, the instrumental records of percentages of durations of sunshine are almost always larger than the observers' personal estimates of percentages of area of clear sky; the average excess for February, 1897, is 7 per cent for photographic and 7 per cent for thermometric records.

The details are shown in the preceding table, in which the stations are arranged according to the *total possible* duration of sunshine, and not according to the *observed* duration.

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table IX, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—The dates on which reports of thunderstorms for the whole country were most numerous were: 20th, 201; 21st, 176; 22d, 187.

Thunderstorm reports were most numerous in: Illinois, 74; Kentucky, 77; Louisiana, 62; Missouri, 70; Tennessee, 63; Virginia, 68.

Thunderstorms were most frequent in: Florida and Georgia, 12 days; Louisiana, 14; Tennessee and Virginia, 10.

Auroras.—The evenings on which bright moonlight must

have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, from the 12th to the 20th, inclusive. On the remaining nineteen days of this month 129 reports were received, or an average of about 7 per day. The dates on which the number of reports for the whole country especially exceeded this average were: 2d, 30; 25th, 23; 26th, 25, and 27th, 16.

Auroras were reported most frequently in: Michigan, 15; North Dakota, 31.

The number of reports was a large percentage of the number of observers in: North Dakota, 80; South Dakota, 20.

CANADIAN REPORTS.

No thunderstorms were reported.

Auroras were reported as follows: Grand Manan, 26th; Yarmouth, 3d, 26th; St. Andrews, 25th; Father Point, 3d, 5th, 20th, 24th, 26th; Quebec, 3d, 9th, 10th, 24th, 25th; Montreal, 3d, 9th, 25th; Kingston, 26th; Winnipeg, 1st, 10th, 20th, 22d to 27th; Minnedosa, 1st, 8th, 22d to 28th; Medicine Hat, 3d; Calgary, 1st, 3d, 4th, 13th; Banff, 25th; Battleford, 1st, 7th, 14th.

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division

The following extracts relating to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective sections of the Climate and Crop Service. The name of the section director is given after each summary.

Snowfall and rainfall are expressed in inches.

Alabama.—The mean temperature was 51.0°, or 1.8° above normal; the highest was 85°, at Elba on the 23d, and the lowest, 12°, at Valleyhead on the 27th. The average precipitation was 6.32, or 1.65 above normal; the greatest monthly amount, 13.53, occurred at Alco, and the least, 2.82, at Newburg. The wet weather has delayed farming operations somewhat, while the continued warm weather of the greater part of the month caused fruit trees to bloom in the southern and central portions of the State.—*F. P. Chaffee.*

Arizona.—The mean temperature was 47.3°, or 1.0° below normal; the highest was 83°, at Parker and Yuma on the 25th, and the lowest, 10° below zero, at Flagstaff on the 22d. The average precipitation was 0.69, or 0.51 below normal; the greatest monthly amount, 2.82, occurred at Pinal Ranch, while none fell at several stations.—*W. T. Blythe.*

Arkansas.—The mean temperature was 46.8°, or 3.4° above normal; the highest was 89°, at Elon on the 18th, and the lowest, 7°, at Silver Springs on the 27th. The average precipitation was 2.59, or 1.91 below normal; the greatest monthly amount, 5.80, occurred at Blackton, and the least, 0.45, at Fort Smith.—*F. H. Clarke.*

California.—The mean temperature was 48.0°, or 0.8° below normal; the highest was 97°, at Volcano Springs on the 28th, and the lowest, 24° below zero, at Bodie on the 23d. The greatest monthly precipitation was 20.14, at Morses House, while none fell at several stations.—*J. A. Barwick.*

Colorado.—The mean temperature was 25.0°, or about normal; the highest was 69°, at Lamar on the 27th, and the lowest, 34° below zero, at Hot Sulphur Springs on the 14th. The average precipitation was 1.72, or 0.67 above normal; the greatest monthly amount, 23.28, occurred at Ruby, where the total snowfall was nearly 20 feet; the least amount was 0.10, at Fort Morgan.—*F. H. Brandenburg.*

Florida.—The mean temperature was 63.0°, or 2.0° below normal; the highest was 90°, at Archer on the 21st, and the lowest, 27°, at De Funiak Springs on the 27th. The average precipitation was 6.57, which is 3.42 in excess of the normal; the greatest monthly amount, 13.23, occurred at Milton, and the least, 1.00, at Orange Park.—*A. J. Mitchell.*

Georgia.—The mean temperature was 51.3°, or 1.1° above normal; the highest was 8.3°, at Morgan on the 22d and Jesup on the 23d, and the lowest, 10° at Gainesville on the 4th. The average precipitation was 7.98, or 3.49 above normal; the greatest monthly amount, 12.43, occurred at Jesup, and the least, 4.29, at Marietta.—*J. B. Marbury.*

Idaho.—The mean temperature was 27.6°; the highest was 67°, at Lewiston on the 28th, and the lowest, 22° below zero, at Chesterfield on the 18th. The average precipitation was 2.11; the greatest monthly amount, 3.80, occurred at Ola, and the least, 0.20, at Oakley.—*D. P. McCallum.*

Illinois.—The mean temperature was 31.2°, or 2.2° above normal; the highest was 73°, at McLeansboro on the 20th, and the lowest, 12° below zero, at Scale Mound on the 27th. The average precipitation was 1.99, or 1.02 below normal; the greatest monthly amount, 5.13, occurred at Golconda, and the least, 0.69, at Bushnell.—*C. E. Linney.*

Indiana.—The mean temperature was 32.7°, or 0.8°, above normal; the highest was 71°, at Mount Vernon on the 21st, and the lowest, 5° below zero, at Angola and South Bend on the 27th. The average precipitation was 2.92, or 0.31 below normal; the greatest monthly amount, 6.25, occurred at Vevay, and the least, 1.16, at Warsaw. The weather was not favorable to growing crops, and wheat and clover are not in a very good condition at the end of the winter, except in a few favorably located fields. Fruit buds seem to be safe so far, except peach buds, which were possibly injured much during the extended cold nights. Stock is in good condition.—*C. F. R. Wappenhans.*

Iowa.—The mean temperature was 24.6°, or 2.4° above normal; the highest was 61°, at Council Bluffs on the 16th, and the lowest, 24° below zero, at Algona and Spirit Lake on the 26th. The average precipitation was 0.88, or 0.54 below normal; the greatest monthly amount, 1.90, occurred at Hawkeye, and the least, 0.22, at Ames.—*G. M. Chappel.*

Kansas.—The mean temperature was 33.5°, or 1.7° above normal; the highest was 77°, at Hutchinson on the 21st, and the lowest, 8° below zero, at Garden City on the 15th. The average precipitation was 1.16, or 0.13 above normal; the greatest monthly amount, 3.45, occurred at Columbus, and the least, "trace," at White Rock. Much of the precipitation was in the form of snow, which was very wet, and falling with but little wind, no drifting occurred; this wet snow, lying as it fell, melting and soaking into the ground, very nearly produced a mud blockade, but was of inestimable value to the State, putting the ground in better condition for the time of year than it has been for some years.—*T. B. Jennings.*

Kentucky.—The mean temperature was 39.8°, or 2.0° above normal; the highest was 76°, at Middlesboro and Williamsburg on the 22d, and the lowest, 8°, at Blandville and Mount Sterling on the 27th. The average precipitation was 5.75, or 1.79 above normal; the greatest monthly amount, 8.86, occurred at Southfork, and the least, 3.02, at Pilot Oak. During the greater portion of the month conditions were favorable for all agricultural interests at this season, and some early plowing for spring work was begun.—*Frank Burke.*

Louisiana.—The mean temperature was 55.1°, or 0.6° above normal; the highest was 89°, at Cheneyville on the 20th and 21st, and the lowest, 24°, at Robeline on the 2d. The average precipitation was 4.25, or 0.40 below normal; the greatest monthly amount, 9.92, accurred at Donaldsonville, and the least, 0.43, at Shreveport. The month lacked sunshine, cloudy weather and easterly winds prevailed during a goodly period; despite this important drawback the close of the month shows farm work progressing over the greater portion of the State, with peach and plum trees in bloom, and the forest trees putting on their spring verdure.—*R. E. Kerkam.*

Maryland.—The mean temperature was 34.8°, or 2.0° above normal; the highest was 63°, at Charlotte Hall on the 17th, and the lowest, zero, at Flintstone on the 1st. The average precipitation was 5.43, or 2.32 above normal; the greatest monthly amount, 9.17, occurred at Sunnyside, and the least, 3.53, at Mount St. Marys.—*G. E. Hunt.*

Michigan.—The mean temperature was 23.6°, or 2.0° above normal; the highest was 54°, at Midland on the 20th, and the lowest, 43° below zero, at Humboldt on the 26th. The average precipitation was 1.26, or 0.69 below normal; the greatest monthly amount, 3.23, occurred at Benton Harbor, and the least, 0.29, at Iona. So far as can be determined, fall-sown crops and fruit buds are in good condition.—*C. F. Schneider.*

Minnesota.—The average temperature was 15.3°, or 2.8° above normal; the highest was 48°, at Luverne on the 3d, and the lowest, 50° below zero, at Leech Lake Dam on the 25th and Pokegama on the 28th. The average precipitation was 1.21, or 0.52 above normal; the greatest monthly amount, 3.00, occurred at Mount Iron, and the least, 0.10, at St. Peter. It is probable that over the whole State the average depth of snow on the ground ranges from 9 to 30 inches, but in the forests it is said to lie fully 4 feet deep. Railroad traffic has been very seriously hindered, especially in western portions of the State, where the roads have been blocked for days at a time.—*T. S. Outram.*

Mississippi.—The mean temperature was 52.4°, or 2.0° above normal; the highest was 87°, at French Camp on the 7th, and the lowest, 18°, at Columbus, Fulton, and Holly Springs on the 27th. The average precipitation was 4.17, or 1.14 below normal; the greatest monthly amount, 8.05, occurred at Mosspoint, and the least, 1.24, at Thornton. The absence of any decided cold waves during the month encouraged

truck farmers and agriculturists in general to push farming operations, and good progress in this direction was the result. Early market gardeners in the middle and southern counties were induced by the early and rapid germination of plants to take some of the more hardy ones from the cold frames and set them permanently in the soil, and the close of the month found these well advanced for the season. Early tomatoes, especially, have made a good start. Some corn was planted in the middle and southern counties, while preparations for planting of both cotton and corn were general over the State at the close of the month. Agricultural, as well as all kindred interests, were affected in the Delta and other river counties by the rapid rise in the Mississippi River which marked the closing days of the month. The public and press were kept constantly informed of the river stages by this office, and timely warnings were issued of the approaching flood, and it was only regretted that these warnings could not be of a more encouraging nature.—*R. J. Hyatt.*

Missouri.—The mean temperature was 34.7°, or 2.4° above normal; the highest was 74° at Mineral Springs on the 21st, Sikeston and St. Charles on the 20th, and Willow Springs on the 17th; the lowest was 15° below zero at Potosi on the 27th. The average precipitation was 2.35, or 0.20 below normal; the greatest monthly amount, 7.88, occurred at Hastain, and the least, 0.54, at Bolckow. Although over the greater portion of the State considerable snow fell during the month, it remained on the ground but a short time, and winter wheat received little or no protection.—*A. E. Hackett.*

Montana.—The mean temperature was 22.0°, or 7.0° above normal; the highest was 65°, at Billings on the 2d, and the lowest, 31° below zero, at Fort Keogh on the 23d. The average precipitation was 0.99, or 0.42 above normal; the greatest monthly amount, 2.53, occurred at Marysville, and the least, 0.08, at Fort Custer.—*R. M. Crawford.*

Nebraska.—The mean temperature was 27.2°, or 3.2° above normal; the highest was 74°, at Curtis on the 17th, and the lowest, 20° below zero, at Hartington and Norfolk on the 26th. The average precipitation was 0.59, or 0.12 above normal; the greatest monthly amount, 1.94, occurred at Valentine, and the least, "trace," at Fort Robinson, Haigler, and Ough.—*G. A. Loveland.*

Nevada.—The mean temperature was 29.6°, or 1.8° below normal; the highest was 67°, at Downeyville on the 27th, and St. Thomas on the 1st, and the lowest, 22° below zero, at Ely on the 22d. The average precipitation was 2.09, or 0.98 above normal; the greatest monthly amount, 5.35, occurred at Lewers Ranch, and the least, 0.07, at Tecoma.—*R. F. Young.*

New England.—The mean temperature was 25.1°, or 2.2° above normal; the highest was 53°, at Middletown, Conn., on the 21st, and the lowest, 29° below zero, at Berlin Mills, N. H., on the 27th. The average precipitation was 2.47, or 1.06 below normal; the greatest monthly amount, 4.51, occurred at North Grosvenor Dale, Conn., and the least, 1.00, at Fairfield, Me.—*J. W. Smith.*

New Jersey.—The mean temperature was 32.5°, or 2.0° above normal; the highest was 59°, at Egg Harbor City on the 21st, and the lowest, 6° below zero, at Rivervale on the 1st. The average precipitation was 3.61, or 0.63 below normal; the greatest monthly amount, 6.37, occurred at Cape May City, and the least, 2.38, at Deckertown.—*E. W. McGann.*

New Mexico.—The mean temperature was considerably below normal; the highest was 79° at Boswell, and the lowest, 22° below zero, at Buckmans. The average precipitation was below normal; the greatest monthly amount, 4.90, occurred at Chama, while several stations report no precipitation.—*H. B. Hersey.*

New York.—The mean temperature was 25.1°, or 2.4° above normal; the highest was 56°, at Primrose on the 21st, and the lowest, 28° below zero, at Saranac Lake on the 28th. The average precipitation was 2.01, or 0.63 below normal; the greatest monthly amount, 4.68, occurred at Willets Point Barracks, and the least, 0.63, at Haskinville.—*R. M. Hardinge.*

North Carolina.—The mean temperature was 45.1°, or 1.5° below normal; the highest was 80°, at Rockingham on the 18th, and the lowest, 9°, at Highlands and Linville on the 28th. The average precipitation was 5.90, or 1.63 above normal; the greatest monthly amount, 10.23, occurred at Linville, and the least, 3.40, at Spring Hope.—*C. F. von Herrmann.*

North Dakota.—The mean temperature was 6.1°, or 1.6° below normal; the highest was 51°, at New England City on the 5th, and the lowest, 40° below zero, at Gallatin on the 26th. The average precipitation was 1.15, or 0.66 above normal; the greatest monthly amount, 2.87, occurred at Berlin, and the least, 0.30, at Larimore. Railroads suffered considerable inconvenience from blockades; travel along the highways was greatly retarded at times by snow drifts. Cattle and horses which have wintered on the prairies have suffered to a great extent from exposure and shortage of grass, and many head of sheep have been killed or died from exposure, owing to the heavy snow breaking down the scant roofing over the sheds in which they were sheltered. A vast amount of snow remained solidly packed upon the ground at the close of the month, which closed with exceedingly cold weather and no signs of a thaw.—*B. H. Bronson.*

Ohio.—The mean temperature was 32.4°, or 2.1° above normal; the highest was 72°, at Portsmouth on the 17th, and the lowest, 9° below zero, at Green Hill on the 27th. The average precipitation was 36.4, or 0.11 above normal; the greatest monthly amount, 8.70, occurred at Portsmouth, and the least, 0.35, at Celina. During the first half of the month wheat was fairly well protected by snow, most of which had fallen during January.—*H. W. Richardson.*

Oklahoma.—The mean temperature was 42.7°; the highest was 90°, at Pond Creek on the 20th, and the lowest, 10°, at Waukomis on the 27th. The average precipitation was 0.96; the greatest monthly amount, 2.11, occurred at Guthrie, while none fell at South McAlester. The month was favorable to winter wheat, which is in fine condition.—*J. I. Widmeyer.*

Oregon.—The mean temperature was 39.7°, or 2.6° above normal; the highest was 71°, at Grants Pass on the 26th, and the lowest, 11° below zero, at Burns on the 20th. The average precipitation was 6.87, or 1.87 above normal; the greatest monthly amount, 20.90, occurred at Glenora, and the least, 0.35, at Silver Lake. The mild weather of February enabled the farmers to do considerable plowing and seeding. While more snow than usual fell in the eastern portion, yet the temperatures following snowfalls were comparatively high, so that ranges were bared rapidly and stock wintered well. So far the weather has been very propitious to the farming interests of the State.—*B. S. Pague.*

Pennsylvania.—The mean temperature was 30.6°, or 2.1° above normal; the highest was 67°, at Indiana on the 22d. The average precipitation was 3.28, or 0.20 above normal; the greatest monthly amount, 6.67, occurred at Somerset, and the least, 1.04, at Indiana.—*T. F. Townsend.*

South Carolina.—The mean temperature was 50.0°, or normal; the highest was 83°, at Gillisonville on the 22d and 23d, and the lowest, 15° at Walhalla on the 28th. The average precipitation was 7.89, or 4.23 above normal; the greatest monthly amount, 10.50, occurred at Georgetown, and the least, 6.08, at Spartanburg. While the heavy rains hindered and impeded plowing, and the preparation of lands and seeding, they were nevertheless beneficial by filling basins of water supply and thoroughly saturating the soil.—*J. W. Bauer.*

Tennessee.—The mean temperature was 44.5°, or 1.8° above normal; the highest was 79°, at Newport on the 22d, and the lowest, 9°, at Hohenwald on the 27th. The average precipitation was 5.20, or 0.10 below normal; the greatest monthly amount, 9.20, occurred at Bristol, and the least, 1.02, at Pope. The heavy rains of 19th to 23d, especially in the eastern section, raised all creeks and rivers to flood height and did much damage in various ways.—*H. C. Bate.*

Texas.—The mean temperature for the State was 1.6° above the normal; there was a general excess throughout the State, except over the east coast district and the extreme eastern portion of north Texas, where there was a deficiency ranging from 0.6° to 4.8° with the greatest deficit in the vicinity of Huntsville; the highest temperature was 96°, at Camp Eagle Pass on the 18th, and the lowest was 11°, at Roby on the 27th. The average precipitation for the State was 1.40 below the normal; it was not well distributed throughout the State, there being none or only a small amount in many sections. No excessive precipitation occurred during the month. The weather during the month was generally favorable for outdoor work and farming operations made rapid progress.—*I. M. Cline.*

Utah.—The mean temperature was 27.0°, or about 6.0° below normal; the highest was 63°, at Fillmore on the 28th, and the lowest, 21° below zero, at Loa on the 22d. The average precipitation was 2.35, or about 1.00 above normal; the greatest monthly amount, 5.50, occurred at Mammoth, and the least, 0.30, at Frisco.—*J. H. Smith.*

Virginia.—The mean temperature was 39.5°, or 1.9° below normal; the highest was 74°, at Salem and Swords Creek on the 18th, and the lowest, 2° below zero, at Buckingham on the 1st. The average precipitation was 6.49, or 2.50 above normal; the greatest monthly amount, 9.71, occurred at Marion, and the least, 3.98, at Guinea. The month was largely characterized by damp, raw, and cloudy weather, with frequent precipitation. Spring work was retarded to some extent thereby and very little done toward preparing tobacco plant beds. Wheat and oats have done well during the month.—*E. A. Evans.*

Washington.—The mean temperature was 37.2°, or 1.2° above normal; the highest was 70°, at Elma on the 26th, and the lowest, 5° below zero, at Waterville on the 22d. The average precipitation was 4.86, or 0.94 above normal; the greatest monthly amount, 11.16, occurred at Tatoosh Island, and the least, 0.85, at Moxee.—*G. N. Salisbury.*

West Virginia.—The mean temperature was 36.8°, or about normal; the highest was 70°, at Beverly on the 21st, and at Buckhannon, Elkhorn, and Philippi on the 22d; the lowest was 3°, at Hinton and Huntington on the 1st. The average precipitation was 5.95, or nearly 3.00 above normal; the greatest monthly amount, 8.18, occurred at Point Pleasant, and the least, 3.00, at Wheeling (river station); winter grain is reported in good condition, except where flooded in river valleys.—*H. L. Ball.*

Wisconsin.—The mean temperature was 21.9°, or 4.1° above normal; the highest was 59°, at Prairie du Chien on the 21st, and the lowest, 35° below zero, at Hayward on the 26th. The average precipitation was 1.17, or 0.20 above normal; the greatest monthly amount, 2.75, occurred at Eau Claire, and the least, 0.45, at Lancaster. The protection afforded winter grain during the month should be of benefit,

although wheat was in poor condition at the end of January.—*W. M. Wilson.*

Wyoming.—The mean temperature was 22.2°, or 0.8° below normal; the highest was 54°, at Fort Laramie on the 28th, and the lowest, 12° below zero, at Sheridan on the 23d. The average precipitation was 0.82, or 0.20 above normal; the greatest monthly amount, 2.30, occurred at Sundance, and the least, 0.35, at Laramie.—*M. G. Renoe.*

JANUARY REPORT.

Missouri.—The mean temperature was 28.2°, or 1.1° above normal; the highest was 72°, at Mineralspring on the 1st, and the lowest, 16° below zero, at Steffenville on the 25th. The average precipitation was 5.19, or 3.34 above normal; the greatest monthly amount, 10.37, occurred at Grovedale, and the least, 1.05, at Bethany.

RIVER AND FLOOD SERVICE.

By PARK MORRILL, Forecast Official, in charge of River and Flood Service.

The *extreme and average stages of water* in the rivers for the current month are given in the following table. Increased precipitation and higher rivers are reported in all sections. The basins of the Missouri and Upper Mississippi are heavily covered with snow and ice, presenting conditions similar to those of the great flood year of 1881.

The following résumé of river stages and conditions of navigation in the respective streams is compiled from reports by the officials of the Weather Bureau at various river stations and section centers:

Hudson River. (Reported by A. F. Sims, Albany, N. Y.)—On February 1 an average of 6 inches of snow covered the Hudson watershed, and, in the Adirondack section, at the headwaters of the Hudson, 15 inches of snow remained on the ground. The ice in the river ranged from 18 inches at Glens Falls to 9 inches at Poughkeepsie. Ice harvesting became general on the 2d, the ice being excellent in quality but very uneven. Heavy rains on the 7th melted all the snow over the watershed, except drifts in the woods, leaving most of the ground bare. On the 8th the ice in the river was covered with water and much honeycombed, in fact it was even dangerous to venture upon. The ice in the Catskill Creek came down on the night of the 7th, and gorged at the mouth of the creek. The river rose at Albany at the rate of 3 inches an hour from 9 a. m. to noon on the 8th, and then fell 14 inches by the morning of the 9th. During the first week of the month the large ice harvesters in the Catskill district secured about half a crop. The quality of the ice improved toward the middle of the month; it became firmer, but was uneven on the under side; all harvesters prepared to resume cutting after more than a week's delay caused by mild weather. The high temperatures of the week ending February 23 again softened the ice, and the turbid water cut it on the bottom, so that the harvesting of ice had to be suspended again. The close of the month finds the ice in the Hudson not in condition to harvest; many small holes which made their appearance refuse to freeze over notwithstanding the last cold wave.

Susquehanna River and branches. (Reported by E. R. Demain, Harrisburg, Pa.)—No floods of importance occurred during the month. The greatest rise reported was 8 feet at Mifflin, on the Juniata, where the river rose from 5 feet on the 22d to 13 feet on the 23d. On the West Branch, the river was closed at Karthaus from the 1st to the 21st. Driftwood Creek was frozen up at Cameron from the 1st to the 22d, and closed again on the 27th. Keating had a closed river from the 1st to the 18th, and during the rest of the month there was more or less floating ice. At Renovo the river was closed until 10.30 p. m. of the 22d, when the ice broke up and began to move out on a rise of about 4 feet. The river was frozen over at Farrandsville until the 24th when the ice broke up and moved out, and in doing so became jammed about the gauge in such a manner as to prevent readings being made the remainder of the month. The ice broke up at Lock Haven at 9.45 p. m. on the 23d, and moved out on a rise of 6½ feet. The river closed with ice for the second time this season on the 28th. At Williamsport the ice began running out on the 24th with a rise of 4 feet, and the river remained open the rest of the month, but its surface was covered, or partly covered, with floating ice. On the North Branch the river was closed at Towanda until the 23d, when the ice broke up and moved away from the gauge, but did not flow out. The river was frozen over at Wilkesbarre till the 20th, when the ice moved out quietly without doing any damage. At Harrisburg the Susquehanna was closed from 4 a. m., January 27, till 2 p. m., February 7. The ice moved out on a rise of about 4 feet from about two-thirds of the channel, but on the Harrisburg side it remained unbroken from the shore to the third pier of the bridge, and for a short distance up the river for several days longer. The river rose 2.2 feet within half an hour after the ice began to move, due, probably, to a gorge below the city. A wall of ice from 20 to 30 feet high, extending from the Wrightsville shore to a point over half a mile out into the Susquehanna, rested on the dam below Wrightsville. Old residents state that they never before saw the ice left in such a condition. It had been piled up by the back water, and after the river fell the ice remained, and it is the opinion of river men that unless moved out by a flood it will stay there until melted away by the warm weather of spring. Two breaks are reported in the dam between Wrightsville and Columbia since the breaking up of the ice. Near the Wrightsville side the dam has been completely gutted for a space of 206 feet, allowing shad to pass up and down the river. The other break reported is on the Columbia side and is fully 150 feet long. A sudden fall of about a foot in the river was thought to be owing to this break.

Rivers of South Atlantic States. (Reported by E. A. Evans, Richmond, Va.; C. F. von Herrmann, Raleigh, N. C.; L. N. Jesunofsky, Charleston, S. C.; D. Fisher, Augusta, Ga., and J. B. Marbury, Atlanta, Ga.)—The low water in the James River which characterized the month of January continued until the 5th of February, when a rise occurred. The immediate effect of the increasing volume of water was to break up the ice which had formed during the cold snap in the last decade of January in the upper portion of the river. This was brought down to the falls of the James at Richmond and banked there until the water pressure was sufficient to carry it down the rapids. At a narrow bend in the river just below the city it again jammed, causing a decided rise. The stream left its banks and overflowed the adjacent lowlands and portions of the city along the docks. The jam was broken by the city tugs, and the rushing water carried away considerable material which had been caught unprotected, and broke vessels from their moorings. The damage to shipping property was, however, slight. After the back water had passed down, the river continued rising until the 8th, when it attained its maximum height of 11.9 feet. It then receded slowly until near the zero of gauge, where it fluctuated, under the influence of moderate rains, until the 21st. At this time heavy rains fell over the entire basin, and on the 22d the river again began to rise. The highest water of the month, 15.0 feet, was reached on the 24th, after which it slowly subsided. Considerable damage was done, especially in the low portions of the city. Shockoe Creek, a small tributary of the river, backed up, filling cellars and in many cases the lower floors of houses, while along the wharves the lower floors of steamship storage houses and sheds were from 3 to 6 feet under water. Streets near the docks were impassable except in boats and street-car service on Lester street had to be abandoned. The damage, though large, was not so extensive as it would have been had not information of the approaching high water been sent out. The various shipping lines had ample warning and had large gangs of men at work getting freight and other movable material out of the way. All the business interests whose places are liable to invasion from the waters of the river were kept fully posted. The damage was confined mainly to the tenants of dwellings who were unable to move to other quarters. The river was back in its banks on the 27th.

The rivers of North Carolina were low at the beginning of the month, but general light rains caused much higher stages by the end of the first week. Heavier rains on the 6th necessitated the first river warning of this season, and all the rivers, especially those in the eastern part of the State, rose sufficiently high to overflow lowlands by the 8th and 9th. The Roanoke reached a stage of 35.5 feet at Weldon, this being 8 feet above the danger line, and the Cape Fear at Fayetteville reached a stage of 36 feet, only 2 feet below the danger line. The warning issued by the Weather Bureau was of value in the saving of stock pastured on the low islands of the Roanoke. The rivers maintained relatively high stages throughout the rest of the month, which was generally rainy, though not excessively so. A secondary flood stage was reached on the 23d to 25th, overflowing some lowlands, but no damage has so far been reported. River beds continued fairly full of water at the end of the month, making further floods by moderate rains an easy possibility.

General and heavy rainfalls, with but few intervals of dry weather, produced two distinct freshets in the streams of South Carolina in February. The precipitation of the 5th and 6th swelled all of the streams to immense volumes. The rivers remained at high stages, and were navigable during the entire month. Considerable merchandise, which was delayed for the want of navigable water, was shipped upon the occurrence of this rise. The Wateree at Camden rose from 16.1 feet on the 6th to 29.7 feet on the 8th, reaching the danger line, 24 feet, early on the morning of the 8th. It again rose from 13.5 feet on the 24th to 22.1 feet on the 26th, remaining at a high stage the balance of

the month. The Pedee at Cheraw rose from 7.8 feet on the 6th to 31.4 feet, 4.4 feet above the danger line, on the 8th. The second freshet occurred in this stream on the 24th and 25th, reaching a 26-foot stage on the afternoon of the 25th. On the 5th the Congaree gauge at Columbia registered 2.4 feet. The stream rose rapidly during the 6th and up to 1 p. m. of the 7th, when it reached a gauge reading of 20.7 feet, or 5.7 feet above the danger line. The water receded slowly on the 8th, but declined rapidly on the 9th, 10th, and 11th. The stream rose 4.5 feet on the 25th and 26th. The Waccamaw at Conway rose slowly throughout the month. It reached the danger line, 7 feet, on the 28th. The Edisto at Edisto, and the Lynch at Effingham, rose slowly up to the 14th, when maximum gauge readings occurred. Like its close neighbor the Waccamaw, the Lumber River showed a steady rise throughout the month, reaching the danger line, 6.5 feet, on the 28th. The rise in the lower Pedee at Smiths Mills averaged 0.8 foot per day from the 6th to the 18th. On the 18th the gauge registered a depth of 17 feet, or 1 foot above the danger line. Following this date the stream declined slowly to a gauge reading of 14.4 feet on the 25th. Its downward course was checked by the heavy precipitation of the 25th, which caused it to rise to a 15.2-foot stage on the 28th. The Santee at St. Stephens was above the danger line from the 14th to the 18th. The flood waters on the lower river courses retarded work considerably on the rice lands. The streams were clear of ice the entire month.

More than the usual quantity of water was present in the Savannah River this February. At Augusta the 20-foot mark was exceeded at three different periods, namely, the 7th, 13th, and 26th. The heavy and excessive rains of the 5th, which were general over the entire drainage area of the Savannah River, produced a rise of nearly 12 feet in twenty-four hours and resulted in the highest river of the month, the other two rises being not nearly so great, although the duration of each was practically the same. Navigation was in no wise obstructed, the river boats making regular trips with full cargoes.

The frequent and in most cases heavy rains which characterized the month added considerably to the water supply of the Georgia streams, except the Etowah, which continued low to the close of the month. The most decided rise occurred in the Chattahoochee at Eufaula, Ala., during the twenty-four hours ending on the morning of the 12th, when a rise of 19.2 feet was shown on the gauge, and during the ensuing twenty-four hours the water reached the danger line, 30 feet, but began to recede before any damage occurred. This river has been at good boating stage all the month. In the Flint a steady rise is noted from the 1st to 18th, after which a gradual fall occurred each day to the close of the month.

Mobile River and branches. (Reported by F. P. Chaffee, Montgomery, Ala., and W. M. Dudley, Mobile, Ala.)—Well-distributed rains over its watershed caused good navigable stages in the Alabama River during the entire month. Heavy rains on the 11th and 12th gave the highest waters about the middle of the month, though there were no freshets or even danger-line stages. On the afternoon of the 14th the river stood at 24.2 feet on the gauge at Montgomery, which is the highest since February, 13, 1896. The rivers fluctuated quite rapidly during the latter half of the month, necessitating some expense to freight handlers in moving freights from low wharves to high ground or the reverse.

The Tombigbee River, which had remained abnormally low for some time past, was also navigable during the entire month and the river interests have reaped large benefits therefrom, as freight has been received in large quantities.

Ohio River and branches. (Reported by F. Ridgway, Pittsburg, Pa.; H. L. Ball, Parkersburg, W. Va.; S. S. Bassler, Cincinnati, Ohio; F. Burke, Louisville, Ky.; and P. H. Smith, Cairo, Ill.)—The ice in the Monongahela River ran out during the last day or two of January. A great deal of ice passed out of the Alleghany on the 6th, 7th, and 8th. Most of the ice from the upper Alleghany came out on the 10th, and just ahead of this ice between 6,000,000 and 8,000,000 bushels of coal passed down the river, after navigation had been closed for about fifteen days. The ice from the Cheat passed out during the 13th and 14th. On the morning of the 23d the water in the Pittsburg harbor was two feet above the danger line and still rising. The flood water came suddenly and unexpectedly in the night. Before serious damage was done, however, warnings were disseminated with the aid of a special detail of police, and movable property, liable to damage by water at a stage of 30 feet, was moved to places of safety. The river continued to rise all day, reaching a stage of 29.5 feet at 11.30 p. m. The flood water came out of the Monongahela River, but during the late afternoon the Alleghany River put out several feet of water and thus caused the dangerous stage in the Pittsburg harbor to continue several hours longer than it would otherwise have done. By 8 a. m. of the 24th the river had fallen to a 29-foot stage, by 8 p. m. to a 25-foot stage, and by 8 a. m. of the 25th to a 19-foot stage.

During the first week of February the rivers in the mountain sections of West Virginia were frozen over and navigation closed. About the 7th general and somewhat heavy rains caused a breaking up, and for several days a heavy run of ice, in the rivers. High waters were recorded at all points but the floods were not serious and interfered but little with navigation after the ice had run out. From this time until the 20th the rivers fell slowly but still maintained good boating stages. The heavy rains from the 20th to the 25th again filled all the rivers, especially those emptying into the Ohio and the Potomac. Sudden and heavy rises occurred and the danger lines at all stations were reached, and at some points exceeded. The heaviest of the floods occurred in the mountains and caused considerable damage to property along the rivers. Railroad operations were totally suspended at many points and much loss resulted. The Ohio at Parkersburg rose steadily from the 21st to the 25th, reaching its highest point, 37.9 feet, at 4.15 p. m. on the latter date. A great many manufacturing, dwelling, and business houses had to be vacated, but no serious damage occurred. The floods in the two Kanawhas were very great and occasioned a considerable loss of property, chiefly lumber and ties. At Charleston a large part of the town was under water and many people were compelled to move. At Parkersburg warnings were issued over fifty hours before the flood crest reached the city and all exposed property was moved and stored in safe places.

Twice during the month navigation on the Ohio at Cincinnati has been suspended. The severe cold snap of the latter part of January filled the river with floating ice and bound up its shores with thick ice. On the first of the month the Kentucky side of the channel at Cincinnati above the Louisville and Nashville Railroad bridge was gorged. Softer weather and rain set in however, which had the effect of clearing the river to some extent, but also of increasing the volume of water and it seemed that a February freshet was impending. An ice gorge formed near the mouth of the Licking River opposite Cincinnati which broke on the 3d, with trifling damage to Cincinnati river property. On the 4th the gorge at the Louisville and Nashville Railroad bridge broke and quietly passed down stream with a rapidly rising river, carrying away the immense ice floes in the harbor. Navigation was now partly resumed, the river continuing to rise rapidly. On the 8th a local warning was issued that the water would reach the danger line, 45 feet, probably in forty-eight hours. On this rise between 7,000,000 and 10,000,000 bushels of coal were shipped from Pittsburg and a light run of coal out of the Kanawha. Navigation was generally resumed and river business unusually good. By the 10th all fears of a serious freshet were removed and merchants in the lower levels of the city, and river men congratulated themselves upon their escape from an expected February flood.

Meanwhile the floating ice and drift sweeping down the river gorged at the Louisville and Nashville Railroad bridge at Henderson, Ky. The river for about 25 miles above that point was covered by an extremely menacing gorge of solid ice, in which logs, trees, and all kinds of débris were wedged. At the Henderson bridge the ice was piled 40 feet high, imperiling the bridge. On the 11th the water came to within 0.4 of a foot of the danger line at Cincinnati, and on the same day the gigantic gorge broke and passed down the river without damage. This gorge is declared to have been one of the most remarkable occurrences in the history of the Ohio River. The river now gradually receded. About the 20th of the month a showery condition of weather set in and there were remarkably heavy rains over the watershed of the Ohio, more especially the region feeding its southern tributaries. On the morning of the 22d the river had risen 11.5 feet in twenty-four hours. The river and rainfall reports and newspaper accounts of great rains showed that a flood, unprecedented in respect to its suddenness, was imminent. A warning was issued that 50 feet (5 feet over the danger line) would be reached at Cincinnati on the following morning and that the rise would ultimately reach about 60 feet. General attention was paid to the warning and great damage by water to goods and merchandise in cellars throughout the wholesale business districts usually in the flooded regions was averted by their prompt removal. On the morning of the 23d the rapidly rising river had exceeded the stage forecast for Cincinnati by 0.4 of a foot. Meanwhile the water had risen above the danger line at Portsmouth, Ohio, Catlettsburg, Ky., and Pittsburg, Pa. The remarkable features of the flood in the Ohio Valley this year were the sudden and almost simultaneous rise at all points and the great length of the crest of wave, promising a slow decline. At Cincinnati the river finally came to a stand at 9 a. m. of the 26th, having reached a stage of 61.2 feet. The timely warnings prevented any considerable actual damage, though the loss sustained in the way of suspension of business, expense of removing goods and other incidental expenses was very great. Lawrenceville, Ind., was saved from its previous fate in flood times by the new levee which withstood the pressure of the water.

It is a singular fact in connection with the Ohio River flood that during the twenty years preceding 1880, the maximum rise in the river did not once occur in February. Records show that since 1880, the highest stage of water at Cincinnati has occurred most frequently in the month of February, eleven out of the past eighteen years having experienced the maximum rise during that month. Since 1860 there have been only two higher stages than that of the past month. On February 15, 1883, the water rose to 66.4 feet, and on February 14, 1884, to the phenomenai height of 71.1 feet.

Ice began to break in the harbor at Louisville on the 3d, which permitted the partial resumption of navigation to up-river points on that date. The heavy floating ice formed a gorge about 20 miles below the city, which precluded the passage of boats in that direction. The gorge gave way on the 8th, and on the following day navigation was open to

all points. A nearly normal stage of water prevailed until the heavy rains of the 20th to 22d, which caused a rapid rise in the Ohio and tributary streams. The Kentucky River and its forks rose with almost unprecedented rapidity during the night of the 21st and 22d, and for some time apprehensions were felt for the safety of some portions of Frankfort, but the flood passed with only damage to roads, bridges, and culverts. All the smaller streams of Kentucky, especially those in the mountain districts, rose beyond their banks, sweeping away logs, sawed lumber, and in some cases small houses. Railroad tracks were submerged, washouts numerous, and traffic delayed. The loss of life was comparatively small, though many hundreds of persons were compelled to abandon their homes temporarily. Middlesborough and Pikeville suffered quite severely, portions of both places being under water for a considerable time. The water fell rapidly in the smaller streams after the cessation of the rain, but the Ohio continued to swell in volume until, on the 28th, it attained a maximum height of 35.4 feet at Louisville, the greatest stage since the disastrous flood of 1884. No damage of consequence resulted in Louisville or adjacent cities.

At Evansville the month opened with a low stage of water and a falling river. At about 3 a. m. of the 10th large quantities of ice began to float down the river at Evansville, which was generally supposed to be due to what was known as the "Wolf Creek gorge." By 7 a. m. the river was filled with ice from bank to bank, running at a rate of 4 to 6 miles per hour; by 9 a. m. the gorge was complete, and remained so until about 4 p. m. of the 11th. At a few minutes before 4 p. m. on the 11th the gorge broke and the ice began moving slowly in the channel, and moved out gradually, leaving the ice on each shore extending from 100 to 125 yards into the river. On the Indiana side it remained until moved out by boats; that on the Kentucky side was removed by the current. The ice was very thick in the river and piled from 6 to 10 feet above the water line. Not much property was exposed to damage, as but few boats had left the ice harbor in Green River, and those that had, returned before the gorge was formed. The water reached the danger line, 30 feet, during the nights of the 9th and 10th, rising 9.5 feet from the morning of the 9th to the morning of the 10th, this rapid rise being evidently due to the forming of the ice gorge below Evansville. The gorge gradually increased until it extended for nearly 9 miles above the city. The river continued rising until the 12th, remained at a stand until the afternoon of the 13th, and then fell until the 21st, when a second rise set in which brought the river up to 42.6 feet by the morning of the 28th. The lowlands adjacent to Evansville have been submerged since the 10th instant.

At Cairo navigation opened on the 2d and the ferryboat of the Three States Company resumed regular trips on the 3d. The quantity of ice in the Ohio decreased until the 5th, when the last of it passed out. A second run of ice commenced on the 11th and passed out during the night of the 11th and 12th. A third run of ice (the Evansville gorge) commenced passing about 5 p. m. on the 13th, increased in quantity until about 7 p. m., and decreased considerably during the night of the 13th to 14th. Small quantities of ice were passing on the 14th and 15th; the last passed out on the latter date. The river rose rapidly from the 6th to the 14th and from the 24th to the close of the month, reaching the danger line, 40 feet, on the morning of the 28th, with prospects of a much higher stage. The adjacent lowlands are being inundated. Reports from points along the river from Evansville to Cairo, relative to the Evansville ice gorge, show that very little or no damage was done by the ice as it floated down the river. River trade at Cairo during the past month has not been as good as in former years, due mostly to stagnation in the lumber trade. Heavy tows of coal passed Cairo, for the south, from the 16th to the 20th.

Tennessee and Cumberland rivers. (Reported by L. M. Pindell, Chattanooga, Tenn., and H. C. Bate, Nashville, Tenn.)—The month of February opened with very low water in the Tennessee. Navigation was dangerous to large boats but good for small ones. The rise from the general rains which fell on January 31 and February 1 ranged from 2 to 6 feet and produced an excellent logging tide on the 5th, which continued until the 13th. On this tide over 5,000,000 feet of logs arrived at Chattanooga from the headwaters; it was the largest flotilla of logs known in many years. Ice began to pass out of the Clinch River at Kingston on the night of the 1st and ceased on the 4th. Navigation opened at Kingston on the 2d. No ice passed Chattanooga during the month, and it is supposed that what came out of the Clinch melted before reaching that point. A good boating tide continued until February 20, when heavy rain occurred over the headwaters of the Clinch and Holston rivers, causing rapid rises in those waters, with heavy drift. The rainfall was 3.30 inches at Speers Ferry and over 2 inches at Bluff City. The rain was heavy over the entire watershed on the 23d, the greatest amount being 3.50 inches at Strawberry Plains, Tenn. The Clinch, Powell, Holston, French Broad, Little Tennessee, and Tennessee rose rapidly, but the Hiwassee was not materially affected, being lower than during any freshet since 1879. The last freshet in February occurred in 1893 and was 1.7 feet less at Chattanooga than that of 1897. On the night of the 22d Beaver Creek was higher by 12 feet than in ordinary high tide and higher than it has been in twenty-one years. Many houses were flooded; all bridges over the creek were swept away. The Tennessee reached its highest stage of 35.1 feet at Chattanooga at 6 p. m. of the 26th. The lower river was still rising at the end of the month.

The month opened with the Cumberland River frozen from Celina to the headwaters, and ice running from Celina to the mouth. Rain on the 1st caused a rapid rise and broke up the ice by the 5th; the river was clear with water ranging from 10 feet at head to 20 feet at mouth. Rains on the 5th to 8th caused another rise and maximum heights were recorded as follows: Burnside, 19.9 feet on the 8th; Carthage, 18.4 on the 10th, and Nashville, 23.1 on the 11th. A steady fall was recorded from this time till the 21st, when unusually heavy rains in the eastern portions of Tennessee and Kentucky caused a sudden and decided rise. At Burnside the rise was 15.6 feet in the twenty-four hours ending at 8 a. m. of the 21st, and 30.1 feet in the next twenty-four hours, putting the water at 51.5 feet, 1.5 feet above danger line, on the morning of the 22d. This was succeeded by a rapid fall and the water was about 8 feet at the close of the month. At Carthage the danger line was reached at 2 p. m. of the 23d, and a maximum of 37.7 was recorded on the 26th, and the month closed with the water at 35 feet. At Nashville the rise was rapid on the 22d and steady till the 28th, when the maximum of 37.6 feet, 2.4 feet below the danger line, was reached, after which it ran out rapidly. Navigation was open from the mouth to Carthage all the month, and above that point after the 5th, and the month closed with ample water and prospects good for heavy business on the river during March.

Mississippi River and minor branches. (Reported by P. F. Lyons, St. Paul, Minn.; F. J. Walz, Davenport, Iowa; F. Z. Gosewisch, Keokuk, Iowa; H. C. Frankenfield, St. Louis, Mo.; S. C. Emery, Memphis, Tenn.; R. J. Hyatt, Vicksburg, Miss.; and R. E. Kerkam, New Orleans, La.)—There has been no change in the upper Mississippi or the Minnesota rivers during the last month, both of them remaining frozen over. Accurate gauge readings could not be made but the height of the surface of the ice field at St. Paul was noted from time to time, and its sag or rise; from these it is estimated that if the water had been at liberty to rise about the gauge an average stage of 3 feet would have been registered. Accounts from the watersheds of both rivers indicate an accumulation of snow far in excess of what it has been in any other winter since 1888 and there has been no thaw which might liberate the snow and ice-bound water since early in January. A stage of water in excess of the maximum in 1888 and 1893 will very likely be attained some time this spring.

Southward to Davenport the Mississippi was frozen throughout the month, the ice varying from 12 to 24 inches in thickness. The ice began breaking up on the rapids above Davenport on the 21st, and on the 22d began moving out at that point, but was stopped by the cold of the night of the 22d, and was again frozen tight during the cold spell which followed. The ice has piled up considerably in the middle of the river above the Government bridge, and will possibly cause damage when it goes out, especially if it should move suddenly.

The river was frozen at Keokuk at the beginning of the month, the ice being 12 inches thick. During the night of the 3d to 4th the ice loosened on the Des Moines Rapids, running down and leaving about half a mile of open water at the station while the river remained gorged 500 yards south of the gauge. Farther loosening of the ice to the north on the 15th caused a sudden rise of 4 feet, which subsided after a few hours. The gorge south broke on the 17th, and on the 18th the river was free from floating ice, while a little shore ice remained in shallow water on the Illinois side. On the 22d light drift ice began running and was increased by new ice forming during the night.

There were no extreme stages at St. Louis. After the 5th the Mississippi remained at an excellent navigable stage, as did also the Illinois River for a considerable distance from its mouth. The ice remained gorged as far south as Louisiana and Clarksville on the 1st, and gorged again the same day above the bridge at Hannibal. It broke at the latter place during the night of the 4th to 5th. On the 8th the ice was once more firm at Burlington and as far south as Louisiana and Clarksville. It remained comparatively firm at Burlington until the 28th when it moved out in the channel, leaving, however, a large quantity of heavy shore ice. Ice passed St. Louis at various times during the month, but it was mostly soft and in limited quantities, not sufficient to interfere with navigation.

From St. Louis to Cairo there was little change during the mouth; the river was quite low during the first decade, but a good boating stage was maintained from the 11th until the close of the month. Below Cairo the river was falling at the beginning of the month and continued to fall until the morning of the 7th; the remainder of the month the river was generally rising, the rise being rapid from the 8th to the 16th.

During the first week in February the Mississippi from Cairo to Memphis fell about 6 feet, when a rise set in, which at Cairo amounted to 20 feet, the flood crest reaching that place on the 17th and passing Memphis three days later with a 16-foot rise, and a gauge reading of 25.1 feet. From the 20th to 25th the river remained nearly stationary. and then a second rise began which continued to the close of the month. The last rise caused considerable uneasiness, owing to the presence of so much water in the lower river and the reported floods in the Ohio. Floating ice, which at the end of January was obstructing navigation, disappeared on the 4th. Large quantities of drift passed Memphis during the 15th, 16th, and 17th, but no serious inconvenience resulted therefrom. The month as a whole was favorable for naviga-

tion, the weather being mild, with a good depth of water at all times, making it possible for coal men to move large fleets of coal barges, many of which passed down during the latter part of the month.

A fall of 9 feet occurred in the river at Vicksburg between the 1st and the 12th of the month and a 2-foot fall at New Orleans between the 5th and 14th. Thereafter, until the closing days of the month, there was a general rise, amounting to some 15 feet at Vicksburg and nearly 4 feet at New Orleans.

The Red River showed a general decline during the month, only one small rise occurring in the lower portion during the first ten days of the month and the river being below a navigable stage during the greater portion of the month above Alexandria except for the lightest craft.

There was a slight rise in the upper Ouachita during the first twelve days of the month, affecting the lower river but slightly. The entire river declined during the last half of the month, but there was enough water for navigation and for log floating in the middle and lower portions during the entire month.

Missouri River and branches. (Reported by L. A. Welsh, Omaha, Nebr., and P. Connor, Kansas City, Mo.)—From Bismarck, N. Dak., to the headwaters reports are received stating that the snow is deeper and the ice in the river thicker than ever before known in that section, with an excellent prospect for floods in the near future. Press reports state that at Chamberlain, S. Dak., the Pontoon Bridge Company has removed its bridge from the river in anticipation of the breaking up of the ice at an early day. Uneasiness exists among the settlers who are located on the bottom lands along the river, and all who can do so are preparing to move their property, or so much of it as is possible, to higher ground before the ice breaks up. Settlers who a week or two ago were disposed to laugh at the fears of their neighbors have now come to a realization of their danger. The fact that the water is at a very low stage and frozen nearly to the bottom in many places renders the danger all the greater in the event that the ice breaks up on the upper river before it does below, as was the case in the spring of 1881, at which time the floods caused so much damage along the lower Missouri. The snowfall has been so great this winter throughout the entire region drained by the Missouri River that if the ice breaks up on the upper river before it does on the lower, sending vast volumes of water down upon the firmly frozen lower portion of the river destructive ice gorges will be formed and damage and loss of life will certainly result.

Grave fears are entertained by the settlers living on the bottom lands along the James River. This stream, although extending for more than 1,000 miles in the two Dakotas, is hardly more than a creek when in its normal state, and is credited with being the longest unnavigable stream in the world. It is very crooked, and drains a wide extent of country. The rich bottom lands on its banks are thickly dotted over with homes, farms, and other property of thrifty and progressive settlers, many of whom will temporarily seek higher ground until the danger is over. Throughout the valley of the James River, which extends from Wells County, N. Dak., to where it empties into the Missouri River, a short distance below Yankton, are vast bodies of snow and ice, which, when melted, will fill the James Valley from bluff to bluff. Should the greater part of the snow go off with heavy rains, as is frequently the case with the spring break-ups of the Missouri and James rivers, the danger would be increased and the most destructive floods since those of the spring of 1881 would be experienced along the two streams.

At Omaha, the river continued frozen over during the month, except about 250 feet on the west shore, where the gauge is located. This open water is due to the hot water from the smelting works and distillery just above the Union Pacific Railroad bridge on which the gauge is located. During the greater part of the month teams and pedestrians crossed on the ice at a point about 1,500 feet below the bridge. At the close of the month the ice had become very weak and for at least 2 miles below the city it was unsafe to cross. A comparison of gauge readings with those of past years, shows that the present stage of water is considerably above the normal.

At the mouth of the Platte, 28 miles below Omaha, the ice broke on the 20th, and at 1.45 p. m. began to move out. At 7 a. m. on the 21st the reading of the gauge was 7.5 feet. At 7 a. m. on the 25th the reading was 11.7 feet. This rise was caused by the ice gorging 1 mile below Plattsmouth. On the 24th the river was again frozen over, the ice being thick enough by the evening of that date to permit pedestrians to cross. The river was frozen over at Plattsmouth at the end of the month, but the water had subsided to a normal stage. From midway between Plattsmouth, Neb., and Saint Joseph, Mo., to Kansas City, the river remained open throughout the month.

At the latter place the river was blocked by ice above and below Hannibal bridge until the 9th, when the ice began breaking up. A jam in the mouth of the Kaw broke up at 4.10 p. m. on the 15th. From the 9th there was considerable floating ice until the 24th, when the river became entirely clear, but floating ice reappeared on the 25th and lasted to the close of the month. On the 1st of the month the ice gorged at Hermann, Mo., resulting in a rise of several feet west of that place. As a consequence the river banks at Lexington, Mo., were overflowed on the 5th. The gorge at Hermann broke on the 8th.

Arkansas River. (Reported by J. J. O'Donnell, Fort Smith, Ark., and F. H. Clarke, Little Rock, Ark.)—The spongy ice gorge anchored in the vicinity of Spruces Island at the end of January broke off and was entirely dissolved by the 10th without doing any damage. During the month a navigable stage prevailed for the river boats as far west as Webers Falls.

The river, which was frozen at Dardanelle at the end of January, opened February 1, and no ice was reported after that date. The river declined during the first three days of the month, but on the 4th a slight rise set in that reached Little Rock on the 5th; it then declined at Little Rock and Fort Smith on the 6th, but continued rising very slowly at Dardanelle. Light rains about this time in western Arkansas and Oklahoma caused a general rise that set in on the 7th and continued through the 12th at Dardanelle and the 13th at Little Rock. The lower river continued to fall slowly from the 14th to 16th, and then rose for two days, afterward declining until the 26th, when it came to a stand, but was falling again at the end of the month. A boating stage was maintained throughout the entire month and there was no interruption of navigation by ice or drift. There was no marked rise or decided fall, the extreme fluctuation at Little Rock for the month being but 4.7 feet.

Rivers on the Pacific Coast. (Reported by W. H. Hammon, San Francisco, Cal., J. A. Barwick, Sacramento, Cal., and B. S. Pague, Portland, Oreg.)—At the beginning of the month unusually heavy rainfall throughout California led to a rapid rise in the American, Feather, and upper Sacramento rivers and in the San Joaquin in the vicinity of San Joaquin bridge. In the Sacramento Valley, owing to the peculiar course of the river channel and the unevenness of the levees, a large volume of water leaves the river channel and passes down the Yolo basin. Thus, while the lowlands are flooded, places along the river bank which are protected by strong and high levees are saved from danger by this very breaking down of the banks at some upper point. On the morning of the 5th the rising streams threatened floods in many parts of the State. At Stockton householders in the districts that were flooded three years ago made preparations for the removal of goods. East of Stockton the country was all under water. At Linden, near the Mormon channel, the water had not been so high for years. Between Linden and Belota the country was covered with water. There was fortunately but a small amount of snow in the higher regions, and the ending of the rain was quickly followed by a fall in the stages of the upper rivers. At the junction of the Sacramento and San Joaquin, however, the waters continued to rise slowly and a large area of land, which had been or would have been planted with wheat, was covered with water. In the extreme northwestern part of the State the Eel and Mad rivers were unusually high and much damage was done by the drifting logs.

The Sacramento River at Sacramento has ranged from 20 to 24 feet, in consequence of which the tule or swamp lands of Yolo County, opposite this city, have been one vast sea of water. The water is not as high in the tule or overflowed swamp land as it usually gets each winter or during the rainy season. There has been no dangerous or rapid rise in the river at this point to cause any alarm to be felt on either side of the river. The levees on the opposite side are lower than on this side and will only stand 28 feet, which is the danger line on the river gauge at this point, but some time before such a height is reached the little village of Broderick, opposite Sacramento, is flooded by back water from the overflowed tule basin of Yolo County. The time of danger to the levees in this vicinity is when heavy rains occur on the American River, and the crest of the flood from that river reaches this city at the same time that the crest of flood waters from the Sacramento River does; at such times the people patrol the levees both day and night if the gauge indicates 26 to 28 feet. Danger to the leveed districts of Yolo County some 20 to 30 miles below this city is from the flood waters of the tule basin flowing back into the Sacramento River through Steamboat and other sloughs in that vicinity. Until the river is thoroughly dredged and the levees raised to uniform heights, every winter immense bodies of water will flow from the river through these great tule basins and back again miles below the point where they first left the river.

The Willamette River was influenced by the rains in the forepart of the month, which caused the river to rise to a height of 13.5 feet at Portland. This height being below the danger line no damage resulted though some anxiety was felt by merchants and others relative to the future action of the waters. At the close of the month the river had fallen to the low-water mark for the month of February.

Heights of rivers above zeros of gauges, February, 1897.

Stations.	Distance to mouth of river.	Danger-line on gauge.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Mississippi River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
St. Paul, Minn.†	1,934	14	.....	.....	.....	.....	.....	.....
Reeds Landing, Minn.†	1,864	12	.....	.....	.....	.....	.....	.....
La Crosse, Wis.†	1,799	10	.....	.....	.....	.....	.....	.....
North McGregor, Iowa†	1,739	18	.....	.....	.....	.....	.....	.....

Heights of rivers above zeros of gauges—Continued.

Stations.	Distance to mouth of river.	Danger-line on gauge.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Mississippi River—Cont'd	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Dubuque, Iowa†	1,679	15	...	...	...	...	...	...
Leclaire, Iowa†	1,589	10	...	...	...	...	...	...
Davenport, Iowa†	1,573	15	...	...	...	...	...	...
Keokuk, Iowa [a]	1,443	14	8.0	4	3.9	27	5.8	4.1
Hannibal, Mo	1,382	17	5.7	23	3.1	1	4.3	2.6
Grafton, Ill	1,284	23	8.8	25, 26	4.8	1	7.3	4.0
St. Louis, Mo.	1,241	30	15.4	25	4.8	2	10.8	10.6
Chester, Ill.	1,170	30	11.6	25	2.9	3	7.5	8.7
Cairo, Ill	1,073	40	40.0	28	14.0	4	28.0	26.0
Memphis, Tenn	843	33	36.4	28	8.0	7	18.3	18.4
Helena, Ark	767	37	33.8	28	14.2	7	25.3	19.6
Arkansas City, Ark	635	42	35.1	23, 24	19.1	9	28.0	16.0
Greenville, Miss	595	40	30.0	23, 24	15.9	9, 10	23.5	14.1
Vicksburg, Miss	474	41	33.3	25, 26	18.0	12	25.9	15.3
New Orleans, La	108	16	11.2	27, 28	7.5	14, 15	9.2	3.7
Arkansas River.								
Fort Smith, Ark.	345	22	10.1	10	3.5	1-3, 6	6.6	6.6
Dardanelle, Ark.	250	21	8.8	26	3.3	5	5.8	5.5
Little Rock, Ark.	170	23	10.2	13	5.5	6	7.6	4.7
White River.								
Newport, Ark	150	21	13.9	12	6.1	4	9.4	7.8
Illinois River.								
Peoria, Ill.	135	14	13.8	26	10.6	17	11.8	3.2
Missouri River.								
Bismarck, N. Dak.†	1,201	14	...	...	...	...	...	...
Pierre, S. Dak.†	1,006	14	...	...	...	...	...	...
Sioux City, Iowa†	676	19	...	...	...	...	...	...
Omaha, Nebr.	561	18	9.7	1	8.3	18	9.0	1.4
Kansas City, Mo.	280	21	11.3	6	8.8	20	10.3	2.5
Boonville, Mo.	191	20	9.8	24	3.6	1	7.3	6.2
Hermann, Mo. [f]	95	21	8.5	23-25	5.7	12	7.1	2.8
Ohio River.								
Pittsburg, Pa	966	22	28.9	24	2.6	2	9.6	26.3
Davis Island Dam, Pa.	960	25	26.6	24	4.4	2, 3	13.3	22.2
Wheeling, W. Va. [b]	875	36	38.7	24	9.5	2	16.1	29.2
Marietta, Ohio [c]	795	25	36.0	25	10.1	6	20.7	25.9
Parkersburg, W. Va. [d]	785	38	37.9	25	8.3	5	20.3	29.6
Point Pleasant, W. Va.	703	36	52.3	25	3.5	1	26.8	48.8
Catlettsburg, Ky	651	50	58.5	25	6.2	1	32.6	52.3
Portsmouth, Ohio	612	50	59.0	25	5.7	1	33.7	53.3
Cincinnati, Ohio	499	45	61.1	26	10.1	2	36.3	51.0
Louisville, Ky. [d]	367	24	35.4	28	5.8	3	16.7	29.6
Evansville, Ind	184	30	42.6	28	9.0	2	27.1	33.6
Mount Vernon, Ind. [e]	148	35	41.9	28	10.5	6	29.4	31.4
Paducah, Ky.	47	40	36.4	28	9.7	3	23.6	26.7
Allegheny River.								
Warren, Pa	177	7	3.0	8	0.8	1-6	1.7	2.2
Oil City, Pa	123	13	7.4	8	1.8	1-3	3.1	5.6
Parker, Pa.	73	20	10.2	9	1.8	3-5	3.7	8.4
Freeport, Pa.	26	20	17.2	23	5.2	1	7.7	12.0
Conemaugh River.								
Johnstown, Pa. [b]	64	7	10.5	23	1.6	6	3.3	8.9
Red Bank Creek.								
Brookville, Pa.	35	8	4.1	24	1.0	1-6	1.7	3.1
Beaver River.								
Ellwood Junction, Pa.	10	14	15.3	9	1.8	1-6	4.8	13.5
Big Sandy River.								
Louisa, Ky.	26	20	46.6	23	5.3	1	17.7	41.3
Cumberland River.								
Burnside, Ky	434	50	51.5	22	3.2	1	16.0	48.3
Carthage, Tenn.	257	30	37.7	26	3.4	1	17.2	34.3
Nashville, Tenn.	175	40	37.5	28	6.2	1	20.2	31.3
Great Kanawha River.								
Charleston, W. Va.	61	30	41.5	23	3.0	1	13.2	38.5
New River.								
Radford, Va.	153	14	11.5	22	0.3	1, 2	3.2	11.2
Hinton, W. Va.	93	14	12.9	24	1.1	1	5.7	11.8
Licking River.								
Falmouth, Ky. [d]	30	25	27.8	23	4.0	19, 20	10.4	23.8
Miami River.								
Dayton, Ohio	69	18	5.9	22	1.4	4	3.4	4.5
Monongahela River.								
Weston, W. Va. [b]	161	18	15.2	23	0.0	28	2.7	15.2
Fairmont, W. Va.	119	25	27.8	23	1.8	1, 2	6.4	26.0
Morgantown, W. Va. [a]	95	20	20.5	23	8.5	20	12.7	21.0
Greensboro, Pa.	81	18	33.5	23	7.5	1-4	12.6	26.0
Lock No. 4, Pa.	40	28	36.0	23, 24	6.7	1, 2	14.3	29.3
Cheat River.								
Rowlesburg, W. Va. [f]	36	14	13.5	23	3.0	{10, 11. 15} {16, 19, 20}	5.3	10.5
Youghiogheny River.								
Confluence, Pa.	59	10	13.6	22	1.4	5	4.5	12.2
West Newton, Pa. [f]	15	23	22.0	23	2.1	11	6.0	19.9

Heights of rivers above zeros of gauges—Continued.

Stations.	Distance to mouth of river.	Danger-line on gauge.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Tennessee River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Knoxville, Tenn.	614	29	26.0	24	1.8	1	7.0	24.2
Chattanooga, Tenn.	430	33	35.0	26	3.0	1	13.3	32.0
Bridgeport, Ala.	390	24	24.3	27	1.5	1	10.0	22.8
Florence, Ala.	230	16	16.0	28	2.9	1	8.4	13.1
Johnsonville, Tenn.	94	21	20.1	28	5.5	2	12.5	14.6
Rockwood, Tenn.	519	20	27.5	25	3.0	1	9.5	24.5
Wabash River.								
Terre Haute, Ind. [g]	165	16	16.1	23	7.0	14	12.9	9.1
Mt. Carmel, Ill. [a]	50	15	19.2	28	5.0	4-6	11.1	14.2
Red River								
Arthur City, Tex.	688	27	4.2	6	3.1	28	3.4	1.1
Fulton, Ark.	565	28	5.2	11	2.7	28	3.8	2.5
Shreveport, La.	449	29	5.6	1	0.5	28	2.9	5.1
Alexandria, La.	139	33	15.6	8	4.1	28	9.4	11.5
Atchafalaya River.								
Melville, La.	100*	31	27.6	28	22.3	15	25.1	5.3
Ouachita River.								
Camden, Ark.	340	39	13.5	12	7.0	28	9.6	6.5
Monroe, La	100	40	26.1	9	19.4	28	24.2	6.7
Yazoo River.								
Yazoo City, Miss.	80	25	14.0	27-28	8.3	3, 4	11.1	5.7
Tombigbee River.								
Columbus, Miss.	285	33	6.5	9	—0.2	23	3.0	6.7
Demopolis, Ala.	155	35	28.6	13	5.4	1	16.6	23.2
Black Warrior River.								
Cordova, Ala	155	30	9.0	12	4.4	20-22	6.2	4.6
Tuscaloosa, Ala.	90	38	25.9	13	3.9	1	15.1	22.0
Alabama River.								
Montgomery, Ala.	265	35	24.2	15	3.5	1	11.9	20.7
Selma, Ala.	212	35	27.5	18	2.6	1, 2	14.2	24.9
Coosa River.								
Rome, Ga	225	30	11.7	24	2.8	1	5.9	8.9
Wilsonville, Ala.	66	15	7.6	26	3.0	1, 2	5.7	4.6
Tallapoosa River.								
Sturdevant, Ala.	69	15	3.0	9	1.0	15, 20, 22	1.8	2.0
Savannah River.								
Augusta, Ga	130	32	27.1	7	7.2	1	15.5	19.9
Edisto River.								
Edisto, S. C	75	6	5.9	14, 15	3.7	5	5.1	2.2
Congaree River.								
Columbia, S. C.	37	15	20.7	7	1.9	1	5.8	18.8
Santee River.								
St. Stephens, S. C.	50	12	13.7	15	7.3	5	9.5	6.4
Waterees River.								
Camden, S. C	45	24	29.7	8	5.2	1	15.1	24.5
Black River.								
Kingstree, S. C.	60	12	10.3	15	6.2	5	8.9	4.1
Great Pee Dee River.								
Cheraw, S. C.	145	27	31.4	8	2.7	1	15.1	28.7
Linch Creek.								
Effingham, S. C	35	12	14.0	14	5.8	1	10.3	8.2
Lumber River.								
Fairbluff, N. C	10	6	6.5	28	2.8	1	5.0	3.7
Waccamaw River.								
Conway, S. C	40	7	7.0	28	3.2	1	5.2	3.8
Cape Fear River.								
Fayetteville, N. C.	100	38	36.5	8	5.5	1	19.2	31.0
James River.								
Lynchburg, Va. [b]	257	18	13.6	24	0.8	2	4.9	12.8
Richmond, Va.	110	10	15.0	24	—0.1	1	4.4	15.1
Potomac River.								
Harpers Ferry, W. Va.	170	16	24.5	24	1.4	1	7.6	23.1
Susquehanna River.								
Wilkesbarre, Pa. [b]	178	14	3.0	24-25	1.0	20-22	...	2.0
Harrisburg, Pa.	70	17	7.9	24	3.0	6	4.6	4.9
W. Br. of Susquehanna.								
Lock Haven, Pa.	63	10	6.5	23	0.5	1-6	1.5	6.0
Williamsport, Pa.	35	20	8.8	24	1.5	2-6	3.6	7.3
Juniata River.								
Huntingdon, Pa.	80	24	8.7	23	3.2	6	4.5	5.5
Sacramento River.								
Redbluff, Cal.	241	23	21.6	6	5.6	27	10.4	16.0
Sacramento, Cal.	70	28	24.2	9, 10	20.5	28	21.6	3.7
Willamette River.								
Eugene, Oreg.	149	10	12.0	16	3.2	27	6.3	8.8
Albany, Oreg.	90	20	18.4	17	5.0	26, 27	10.4	13.4
Salem, Oreg.	69	20	17.6	17	5.6	27, 28	11.0	12.0
Portland, Oreg.	10	15	13.5	17	3.5	27	8.7	10.0

*Distance to the Gulf of Mexico. †Frozen. [a] Frozen 1-3. [b] Frozen 1. [c] Frozen 1-5. [d] Frozen 1-2. [e] Frozen 1-6. [f] Frozen 1-7. [g] Frozen 1-13. [h] Frozen 1-19.

SPECIAL CONTRIBUTIONS.

WIND NOMENCLATURE.

By FRANK W. PROCTOR (dated April 2, 1897).

There is such variance of verbal usage among meteorologists in stating the direction of horizontal air movements, except when they are spoken of as winds, that it is frequently impossible to understand from the words used what the direction is.

The following quotations will serve as illustrations:

"Easterly current" [from the west].—FERREL.

"Westerly current" [from the west].—CLAYTON.

"Northeast current" [return polar current].—DAVIS.

"Southwesterly currents" [from southwest].—CLEMENT LEY.

"Easterly current" [from the east].—ABERCROMBY.

"West current" [from the west].—ABBE.

In speaking of *currents* of air all of the authors cited, save

one, indicate the direction of motion by referring to the source. Ferrel alone names his current with reference to its destination.

With singular inconsistency *motions* and *movements* are frequently denoted by adjectives showing whither the air goes, as will be seen by the following:

"Westerly motion" [toward the west].—FERREL.
"Easterly wind movements" [toward the east].—CLAYTON.
"Southeasterly movement of low" [toward southeast].—ABBE.
"Westerly motion" [toward the west].—WALDO.
"Westerly moving air" [toward the west].—BIGELOW.

But this usage is not uniform, for the opposite is seen in—

"Northeast motion" [from northeast].—ABERCROMBY.
"Southwest movement of upper air" [from southwest].—ABBE.

Components and *direction* give further differences:

"West component" [westward].—FERREL.
"The westerly component" [eastward].—CLAYTON.
"Westerly component" [westward].—BIGELOW.
"Southerly component" [northward].—CLAYTON.
"Wind deflected into a northeasterly direction" [toward northeast].—FERREL.
"The deflection from the general westerly direction" [eastward].—CLAYTON.

Drift furnishes further anomalies:

"Northerly drift" [from the north.]—CLAYTON.
"Direction of drift" [toward which it moves].—CLAYTON.
"Direction of currents" [from which they come].—CLAYTON.

Occasionally a *wind* is named from the direction toward which it blows.

"Easterly winds" [from the west].—WALDO.
"Westerly winds of the tropics."—A. J. HENRY.

Other peculiarities of wind nomenclature may be found.

"The return polar underflow [would cause] west-northwest winds until entering the latitudes of the trades their *course turned around to northeast*" [italics supplied].—DAVIS.

"Numerous studies of cyclonic circulation have shown that the higher currents blow more *to the right* [italics supplied] than the surface winds."—DAVIS.

"All across the temperate zone * * * we find the prevailing westerly winds; the surface members *blowing west-southwest*" [italics supplied].—DAVIS.

"Tropical trades blowing westerly."—BIGELOW.

"The trades which blow in a somewhat westerly direction."—LEY.

The foregoing examples are selected at random, not as being typical nor in criticism of any of the books from which they are taken, but simply as convenient illustrations, and for the purpose of calling attention to the fact that there is no uniform usage in naming wind currents, and to the desirability of having them described in such terms that no ambiguity can arise.

Currents of water commonly have their direction described by the points toward which they flow, and it would seem to be the better way to follow this usage with air currents when using, with reference thereto, the words *current*, *movement*, *motion*, *direction*, *drift*, etc., giving to the word *wind* alone a name referring to the source of motion.

NOTES BY THE EDITOR.

SUGGESTIONS TO OBSERVERS.

The Weather Bureau requires from its regular observers, as obligatory, a great variety of meteorological data, such as is liable to be called for at any moment by the business men and the citizens of the country, or by any scientist. The voluntary observers may be classified according to the object, the character and completeness of their reports. The greater number belong to that class whose main work consists in keeping a faithful record of the maximum and minimum temperatures, the total precipitation, and, possibly, the snowfall, the frosts, the hail, the wind, and all other matters that specially affect agricultural interests. Then comes the small class of those who keep a more complete record (sometimes even with self-registering instruments), adapted to determine all the important climatological elements of a given locality. Besides these there are other persons who interest themselves almost entirely in one narrow line of study, such as tornadoes, thunderstorms, auroras, wind velocity, the amount and rate of rainfall, the distribution of frost, the formation of frostwork, the photography and the altitudes and movements of clouds. These, and other subjects too numerous to mention, have each their special devotees, and those who are busied in such special work may be known as "special observers" independently of any activity as regular or voluntary observers. The pamphlets of instructions and the forms for the daily use of the regular and the voluntary observers, are, of course, necessarily reduced to the smallest possible bulk, and those who desire instructions, or rather suggestions, relative to special classes of observations must be provided for by special instructions and forms.

The attention of the reader, and especially of the section directors, is respectfully called to the current Table IX, formerly Table X, showing the frequency of thunderstorms and auroras for the month. In this table is given the number of stations (both regular and voluntary and special) that reported thunderstorms or auroras on any given day between midnight and midnight, of local standard meridian time. If, for instance, Arkansas having 51 stations sends 16 reports of thunderstorms on January 2, then we would naturally infer that thunderstorms occurred at about one-third of the stations, or over one-third of the State on that day. But this inference is liable to serious error for several reasons: (1) Some of the stations may have made no attempt to keep records of thunderstorms; (2) some stations may have recorded only those storms that passed over the station with rain, while others may have recorded any storm that passed within a mile, or within five miles, or even within sight of the station. In making up the annual summaries of thunderstorms and auroras for 1895 and 1896, the number of stations published from month to month, as reporting meteorological data in general, was replaced by the estimated number of those which probably sent a fairly complete record of thunderstorms and auroras. It is now desired to revise these numbers with greater exactness, and the Editor, with the permission of the Chief of Bureau, would earnestly request each voluntary observer to inscribe upon each monthly report some indications as to his rules for observing and recording both thunderstorms and auroras. The information particularly desired just now is the following:

Do you make a special and regular effort to complete your record, so that it shall show every thunderstorm and every aurora, or does it give only some of those that happened in your vicinity?

To those observers who aim to make a specially complete

record of thunderstorms and auroras it is recommended that the following items be observed and that a special record be kept in accordance therewith.

Electrical phenomena should be recorded under some one of the following eight classes:

1. Thunderstorm at the station. 2. Thunderstorm passed near, *i. e.*, within 3 miles of station. 3. Distant thunder. 4. Distant lightning, such as it may be presumed belongs to a distant thunderstorm. 5. Lightning observed near at hand without thunder. 6. Fireballs. 7. Luminous clouds. 8. Auroras.

Hailstorms, high winds, tornadoes, waterspouts, and other interesting phenomena may accompany a thunderstorm, but these are not to enter into the classification, the main object of the thunderstorm observers being to distinguish between thunder and lightning as such and the other phenomena. Under classes 1 and 2 the items to be observed are as follows: The time of hearing the first thunder (*a*) and the last thunder (*b*); the azimuthal bearing of the thundercloud when first seen (*c*) and last seen (*d*); the temperature of the air before the storm (*e*), the maximum and minimum temperature during the storm (*f*) and after the storm is over (*g*); the direction of the wind (*h*) before, (*i*) during, and (*j*) after the storm; time of beginning (*k*) and ending (*l*) of rain or hail; the maximum force of the wind (*m*) and its direction (*n*); total amount of precipitation (*o*) and the approximate amounts, separately, of the rain (*p*) and the hail (*q*); the occurrence (*r*) of tornadoes, waterspouts, and other interesting phenomena.

Under class 3, distant thunder, note the time of the first thunder (*a*) and the last thunder (*b*) and the directions (*c* and *d*) from which these respectively appeared to come.

Under class 4 note the times (*a* and *b*) and the directions (*c* and *d*) in which the lightning without thunder was first and last seen.

Under class 5 give a description, as detailed as possible, of all the circumstances attending these rare and interesting cases.

In the monthly summary of thunderstorms keep these five classes separate. When several thunderstorms occur in the same day, adopt the rule that thunderstorms separated by a period of time or a region of clear sky such as separates one cloud from another, are to be counted as separate storms.

Under class 6, fireballs, St. Elmo's lights, globular lightning require such special description of the attending circumstances as the observer may think appropriate. No special instruction has as yet been suggested.

Under class 7, luminous clouds on dark nights, when it does not seem likely that their illumination is due to fires or lights on the earth's surface, are frequently observed, and every case of the kind should be carefully noted, as these probably often result from a feeble and gentle electric discharge going on within the clouds. In the winter season similar electric glows have been observed from snow-covered hills and mountain peaks.

Under class 8, auroras should be looked for carefully all over the sky at one or more specific times during every night, *e. g.*, 6, 7, 8, 9, or 10 p. m., and the record should show whether, at those moments, the sky is (*a*) clear and the aurora absent, or (*b*) clear and the aurora visible, (*c*) cloudy enough to obscure an aurora, or (*d*) illuminated by moonlight or twilight enough to obscure an aurora. The monthly summary would, therefore, read, *e. g.*: 8 p. m. daily observation; five cloudy nights; ten clear nights with aurora and ten clear nights without an aurora; five nights when moonlight and twilight interfered. If a description of the aurora is attempted, it should include the apparent angular altitude and azimuth of the ends and summits of arches and beams, and of the center of the corona.

FALL OF AN AEROLITE IN ARIZONA.

Although in the progress of science, aerolites, meteoric stones, and shooting stars have been shown to be foreign bodies circulating through space, and generally circulating about the sun, and are, therefore, now studied by the astronomer rather than by the meteorologist, yet, on many accounts, they are of interest to the latter and should always be recorded by meteorological observers. The atmospheric phenomena that are within the bounds of observation from any one station are, ordinarily, not more than 25 miles distant, or considerably less than one-half of a degree of a great circle, so that 100,000 stations scattered at a distance of 50 miles apart over the whole earth's surface would be needed if we were to attempt to keep watch on all that happens in the atmosphere. If a complete record of shooting stars be desired a number of observers must be placed at each station in order that each may confine his attention to a small and definite portion of the sky, since no one person can keep the whole of it under supervision continuously. It follows that if a single observer records all the meteors seen in a small portion of the sky, this number must be multiplied by several hundred thousands, if not millions, in order to obtain an idea of the total number that enters the earth's atmosphere. Even if we confine our attention only to the largest shooting stars that descend as aerolites to the earth's surface it is evident that there may be 100,000 of these for the whole earth every year, since those actually recorded by observers must be a very small proportion of the whole number. It is plausible that by the action of innumerable meteors the earth receives a minute but steady increase in its mass, a steady addition to its heat and a steady diminution of its atmosphere by the consumption of its oxygen; but these quantities are not appreciable in meteorology. The principal interest that science finds in an aerolite consists in its mineralogical structure, its geological history, and its astronomical path, since it comes to us, as it were, from other worlds than ours. It is very desirable that every aerolite be promptly secured and preserved from destruction by being placed in some public museum, and that a notice of this fact be published in some scientific journal, so that the experts in the study of meteors may become aware of its existence and location.

The following account of a meteor in Arizona is communicated through W. T. Blythe, Observer and Section Director for the Weather Bureau at Phœnix, Ariz.:

TOMBSTONE, ARIZ., *February* 27, 1897.—On Wednesday afternoon, February 24, at 3.45 local time, or 2.45 Pacific time, sitting in the house I heard a noise resembling thunder, but yet not like it, lasting 15 or 20 seconds. I felt no vibration or movement of any kind. On inquiry in this town I find that a meteor fell near by; many say that they saw it, and many concur in saying that windows and doors rattled, etc. I am told that a piece of the meteor has fallen at St. David about 12 miles away, and I have written to see if I can secure the stone for the public.—*Henry M. Gee, Voluntary Observer.*

From a newspaper slip inclosed by Mr. Gee, we learn that the meteoric stone which fell near the ranch of J. N. Curtis, a short distance below St. David, was secured by the latter. It weighed 27 pounds, and had buried itself in the ground after plowing up the earth for a considerable distance. At Tombstone the broad white lines which marked the flight of the meteor from southwest to northeast, were distinctly seen after it passed. At Benson this trail remained visible for fully five minutes. At Tombstone the interval between its visible passage and the subsequent explosive sound was about 50 seconds. The noise as of a great explosion was heard, but especially at Dragoon and Benson. Tombstone is in latitude 31° 40′ N., and longitude 110° 5′ W. Benson is about 25 miles northwest of Tombstone. Dragoon station is about 25 miles north of Tombstone. St. David is about 15 miles northwest of Tombstone.

A special report on this meteor received from Prof. S. M. Woodward, of Tucson, says:

The meteor was seen by enough people to have determined everything about its path if those who saw it had taken pains to accurately observe the directions and the times. The way people were deceived by it was amusing. One thought that it fell a few hundred yards away from our buildings on the Mesa, but it must have been distant at least 60 miles; he says it looked like an incandescent lamp bulb floating softly down. A woman ducked her head and thought it went over her no higher than the tops of the telegraph poles. Many people thought they saw where it fell and went to look for it, but afterwards could not remember the exact point where they were standing or the direction in which it disappeared. I have not been able to substantiate the report in regard to a piece falling from it near St. David. The following is a summary of such facts as I have been able to gather:

About 2.50 p. m., Pacific standard time, on February 24, a large meteor fell in Arizona. It was seen by a number of people in Tucson and vicinity as a brilliant light in the east although the sun was shining brightly at the time. The path was nearly perpendicular to the horizon, and was marked by a distinct ribbon-like band of white vapor which persisted for several minutes. The meteor was seen by a man about 25 miles west of Tucson, by a man in Sonora, Mexico, and by people in Benson, Tombstone, and Solomonville.

From Sonora it seemed to fall in the direction of Tombstone or Pearce, and from Benson in a direction somewhat north of east. At Benson the meteor was seen to explode when near the horizon, and the loud noise of the explosion was heard after an interval, estimated at from one to three or four minutes.

At Dragoon the noise was heard and described as terrific. From Wilcox and vicinity there are only rumors of the meteor having been observed. At all places as nearly as can be learned the path seemed to be nearly perpendicular to the horizon. If any pieces reached the earth, they probably fell near Dragoon. The few accounts from points to the eastward would be accounted for by the bright afternoon sun.

To those who are disposed to assist in determining the altitude, the velocity, and the direction of the path pursued by such a meteor, the Editor would say that the observations required for this purpose are of the simplest possible character, but owing to the suddenness of the apparition and its short duration, such observations can not be expected to be very accurate. In fact, the principal difficulty that is usually found results from the discrepancies of observers who are bewildered by the novelty of the phenomenon. The intelligent voluntary observer who desires to contribute to this subject in case an aerolite or bright meteor passes near the station, should simply collect from as many persons as possible, accurate and definite statements as to the apparent angular altitude and azimuth or bearing of the point where the meteor was first seen, and again of the point where it was last seen. These two items, or either one of them are probably all that any one is likely to observe or remember. If the meteor causes trees and buildings to cast a sharp shadow, then by remembering the location of the shadow one may afterwards determine the angular azimuth and altitude of some point in the path of the meteor. If the observer can count seconds carefully by his watch and thus determine the time that elapses after the passage of the meteor, before he hears the sound, that is also a desirable item. Of course a number of observers must contribute the results of their observations in order to make it possible for any one to compute the true altitude and path of the meteor.

CYCLES IN METEOROLOGY.

An esteemed correspondent, the well-known voluntary observer at North Lewisburg, Ohio, Mr. H. D. Gowey, calls our attention to the fact that according to the year book of the Department of Agriculture for 1895, page 161, the severe freezes in Florida occurred in the winters of 1747, 1766, 1774, 1799, 1828, 1835, 1850, 1857, 1880, 1884, 1886, 1894–95, and that furthermore a cycle of about seventeen years is indicated by these numbers, that is to say, any one of these dates is removed from some other date by some multiple of seventeen years. He also asks whether high waters and low waters do not recur in similar periods. Our reply must be, that all depends on which temperature or high water, or frosts we choose to select for our study and which we reject as unimportant. The above list of severe freezes in Florida (see MONTHLY WEATHER REVIEW, 1895, pp. 336–337) may be supplemented by many other years when the frosts were less severe or more local, and the cycles will depend upon the dates that we study.

As Mr. Gowey states that he is not much of a believer in cycles of weather we may, without giving offense, quote this 17-year cycle as another illustration of the ease with which artificial and empirical numerical relations can be discovered in the complex phenomena of meteorology. These relations are usually not very exact but they look mysterious to the wondering eye, and always suggest an inquiry as to whether there is anything in them, that is to say, whether they represent a natural law and can be utilized for weather predictions. So many such cycles have been worked out and they are, one and all, so useless for the purposes of weather prediction that we can not encourage any one in giving much attention to them; and yet as Kepler with his planetary laws and Schwabe with his 11-year sun spot cycle, and Chandler with his 423-day period in latitude, have each respectively discovered important natural cycles, so we suppose it not impossible that cycles of corresponding importance may be discovered in meteorology. On the other hand the ground has been worked over so well in the past three hundred years that there seems no probability of discovering any *simple* natural cycle; in fact, meteorological conditions are so complex that no simple cycle can possibly exist for any long time with any reasonable degree of accuracy. For instance, if we have a daily cycle of temperature in the temperate regions, it will repeat itself for two or three days only before some disturbance breaks it up; if we have a weekly cycle of rainy days and fair weather it may last four or five weeks at the most before being broken up, and it will be several weeks before it starts over again; if we have an annual cycle of cold and hot weather, or rainy weather and drought, or stormy weather and pleasant, it will continue for only two or three years before being so entirely changed as to be unrecognizable. Even the long cycles of eleven, seventeen, nineteen, thirty-five, and fifty-five years that have been "demonstrated" by their respective advocates, disappear after two or three repetitions, only to start up again by and by. These all remind one of the great ocean waves that advance across the Atlantic with perfect regularity but when they reach their limit die away, soon to be replaced by another set of similar waves, so that the whole ocean is covered with waves superposed upon each other, each having its own periodicity, and each set dying out as another replaces it. Within each group of waves there is the periodicity that the cyclist is seeking after, and yet there is also therein an element of dissolution that soon brings the cycle to naught. The cycle like the wave was evolved by a temporary combination of minor elements, and like it soon dissolves into other combinations.

As bearing upon this same subject, the Editor has just received a most instructive pamphlet, *Wetterperioden*, by Guido Lamprecht, published as a scientific appendix to the annual report for 1897 of the gymnasium or college at Bautzen. In this work Lamprecht gives the result of computations that have occupied his time for the past ten years, and he hopes that he has demonstrated that there are short periodicities in the weather. We must, however, distinguish between those periodicities that we have some reason for expecting, such as the lunar tidal periods and those that are purely empirical; we must also distinguish between apparent periodicities whose uncertainty, as shown by the disagreement with observations, is large, and those whose agreement is very close. Lamprecht derives his results from over 52,000 months of total rainfall, a number vastly greater than those used by any of his predecessors, and his stations are scattered throughout Germany,

Austria, Italy, Sumatra, Java, and the East Indies. He first examines this mass of data for lunar periods. The synodic lunar month has an average length of 29.53059 days; the anomalistic month is 27.55457 days. The common period for these two is 411.7934 days. Within this interval the moon experiences the greatest disturbance in the form of its orbit, whose eccentricity varies between 0.044 and 0.066. Arranging his monthly data with reference to this period he finds that for six groups of stations in Prussia, Saxony, Austria, Italy, and Sumatra, the precipitation is a maximum when the perigee of the moon agrees with the lunar octant. For Java and Sumatra he had only sixteen years of observations, which was not quite long enough to demonstrate the action of the moon. His conclusions may be expressed in other words, as follows: The influence of the moon is such that the greatest rainfall occurs when the lunar perigee coincides with the full moon, and the least rainfall when the perigee coincides with the new moon. The excess when the perigee agreed with the full moon averaged about 10 millimeters in forty-one days, or 1 millimeter in four days, over the minimum rainfall when the perigee agreed with the new moon. In a second check computation Lamprecht considers only the number of the rainy and the dry months, calling those months rainy that had an excess of rain over the normal, and those dry that had a deficiency. He finds that 61 per cent of the months when the perigee agrees with the full moon are also wet months, leaving 38 per cent that do not agree with his previous conclusions. This is quite opposed to the hypothesis of Falb, according to whom the moon exerts its greatest influence in producing rain when the perigee agrees with the new moon. Having firm faith in the physical reality of the 411 or 412 day period, or 14-month period of the rainfall for Europe, Lamprecht assumes that it applies to the whole earth, and undertakes to explain the corresponding necessary action of the moon on the atmosphere in order to produce this period. He goes into a discussion of the zodiacal light considered as a ring of matter revolving around the earth and subject to perturbations from the moon, and urges that photographs of this light be obtained for further investigation. After some lucubrations on atmospheric electricity, he passes to the discussion of another period in the rainfall, namely, 423.82 days. This gives him for Europe a maximum rainfall at the middle of the period. The difference between the length of the lunar period, 411.79, and this new astronomical period, 423.82 days, is almost exactly twelve days, and the period common to them both is 39,732 years. Lamprecht says:

> I consider the period of 423.82 days as that in which the node of my hypothetical ring of matter circulating around the earth describes 360 degrees on the earth's equator, but it is very possible that my period is identical with Chandler's period in the variation of the earth's axis, so that this latter remarkable variation may be due to the oscillations of the ring of matter around the earth.

Lamprecht then passes to the study of a period of 11.8846 days, and considers that its existence is established with sufficient accuracy, and that it is caused by the synodic revolution of his ring around the earth. "In general, these various periods, and others that may be established, are the cause of the great variety of weather that we experience from day to day."

To this latter remark the Editor would offer the suggestion that by careful arrangement of data we may be able to work out an immense number of periods whereby to represent the occurrence of any series of phenomena; but we are not justified in saying that the periods cause the phenomena, or that the phenomena are the result of these periodicities. Who, for instance, would say that school children have a periodic tendency to go schoolward in the morning and homeward in the afternoon, and that their general behavior is the result of a number of such periodic tendencies? The fact is that they, like the rain and weather, are controlled by laws higher than mere arithmetic periodicities. The study of the fundamental laws of nature gives us a higher style of meteorology than the study of periodicities.

A MACHINE FOR CALCULATING PERIODICITIES.

Our readers are doubtless familiar with many forms of calculating machines; those for mere addition and multiplication are in use in every large counting house; the Hollerith machine, invented for the use of the United States Census Bureau, for the purpose of classifying and averaging a great variety of data, was recognized as a labor saving contrivance of immense importance. A desire has often been expressed for a machine that should discover recurring periods in any given series of numbers. The Editor has often worked over the sine and cosine formula for this purpose, but neither that or the purely arithmetical, nor the purely graphical methods are entirely satisfactory when we wish to discover wholly new periods. For this purpose Mr. Lamprecht tells us that he has used such a machine, and the Editor hopes to obtain a description of it for publication.

THE DEVELOPMENT OF THE KITE BY EUROPEAN SCIENTISTS.

Inasmuch as it has been remarked that the literature of science seems to offer but few memoirs that deal with the mechanics of the kite, it is, perhaps, worth while to call attention to those that have come to our notice. The name "kite," or "paper kite," as used in English; the cerf-volant, or flying stag of the French; the Fliegende Drache, or flying dragon of the Germans, and the *draco volans papyrus* of modern Latin, all point to the ancient custom of constructing these kites in fanciful imitation of animals; this custom was doubtless introduced into both Europe and China from some more ancient common source.

To the kindness of Professor Hellman, the Editor is indebted for a copy of a work in French whose title may be translated thus: A Memoir on Methods of Protection from Lightning inside of Dwellings, followed by a Letter on the Invention of the Electric Kite, with documents corroborative of this same letter by M. de Romas. Bordeaux, 1776.

This interesting book contains 20 pages of preface, 95 pages of the memoir, 49 pages of the letter followed by 12 pages of documents, to prove that M. de Romas invented or thought of the electric kite before Franklin applied it. It seems to be established that already, June 12, 1752, de Romas had written a letter recommending that the kite should be used to raise an iron bar as conductor in order to test the question whether the lightning was due to electricity, and that, furthermore, August 19, 1752, de Romas communicated to the Chevalier de Vivens the project that he had conceived of drawing electricity from the clouds by means of the kite, and that, furthermore, de Romas had, in August, 1752, commissioned Dutilh to construct an electric kite, but that the latter had delayed until the season for using it in 1752 had passed by, so that the first actual experiment made by de Romas was May 14, 1753, after he had heard of Franklin's success.

We are not at present interested so much in this question of priority in electrical discovery, as in collecting the scattered items that bear upon the history of the development of the structure of the kite, and the theory of the mechanical problems involved in flying it. Some such items were published in the MONTHLY WEATHER REVIEW during 1896, and the following items bearing upon these questions are extracted from various parts of de Romas' little volume:

DE ROMAS ON THE KITE.

De Romas' first kite appears to have been ready for use only a little while before its first use on May 14, 1753. A picture of it is given in his frontispiece and a description of the

electrical attachments on pages 86–88. The shape reminds one of a boy's bow-kite with a long heavy tail, and it could not have flown very high, as de Romas says that he wound the string of his kite with a slender copper wire, so that when he flew the kite for the second time, June 17, 1753, the kite string itself gave out sparks 7 or 8 inches long.

On page 119, in the course of his letter addressed to the Author of the Journal Encyclopédique, de Romas quotes from his own first memoir, dated October 19, 1753, as follows:

A kite is to be constructed, that is to say, one of those frameworks covered with paper that are flown by youths; the bigger the framework is made the higher will it rise, because it will be able to sustain greater weight of string [and he then adds in a note, which must be considered as written in 1768, or possibly 1776] I have demonstrated that in order to raise the kite very high it is necessary that the dimensions of the surface should be proportionate to the length and thickness of the string. Of course, the longer and thicker the thread is so much the more will it weigh, and the more it weighs so much the more will it weigh down the kite. From this observation one may judge whether Franklin's kite composed of two sticks instead of two reeds, and of a silk handkerchief, no matter how large we may suppose it to have been, having openings in its tissue that would not be found in a sheet of paper, could, possibly attain to the height of the clouds, as Priestley in his history, said it did do.

In a note on page 129, de Romas quotes from Franklin's letter of July 29, 1750, where he recommends—

To stick a piece of pointed iron wire into the upper end of the kite in order to assure that as soon as any cloud full of lightnings should pass above the kite, the pointed iron wire would attract the electric fire from this cloud.

The picture of de Romas' kite, as shown in his frontispiece, shows that it was pointed at the lower and upper ends, and, although it may not have carried Franklin's electric needle, yet its pointed shape facilitated this electrical use. The theory of those days, according to which the kite collected the electricity of the cloud and the string conducted it downward, was subsequently dissipated by the experiments of Cavallo and his successors.

MUSSCHENBROEK'S THEORY OF THE KITE.

The first extended consideration of the theory of the action of the wind on the kite that the Editor is aware of is that published by J. A. Euler, eldest son of the famous Leonhard Euler, in the memoirs of the Berlin Academy of Sciences for 1756, some account of which will be given later. As this volume was not actually published until 1758, Euler was in fact preceded by Peter van Musschenbroek, the eminent professor at Leyden, who flew his kite in 1756–57; he died September 19, 1761, but his Introduction to Natural Philosophy was published posthumously in 1762, under the editorship of J. Lulof. We give Musschenbroek's theory in full, as translated from page 177, Article DLXXIII of Vol. I of the *Introductio ad Philosophia Naturalem*, by Peter van Musschenbroek, published in 1762, at Leyden, shortly after the death of this eminent philosopher. After treating of the composition and resolution of motions, Musschenbroek proceeds as follows (his figure is reproduced in our Fig. 1, Chart VII):

Article DLXXIII. Let us begin with an easy example, namely, with the paper kite which is carried up on high by the wind. To the central axis, *A B*, the loose cord, *D E C*, is fastened; if the string, *E M*, which is held by the hand, is fastened (at any intermediate point whatever, such as *E*), then when the cord makes the angle, *D E C*, equal to 54° 34′, the wind blows the kite horizontally with a maximum force and strikes *A B* obliquely. Let the perpendicular, *OH*, fall upon the line *A B*, it will express the direction and motion (pressure) of the kite; let the pressure, *O H*, be resolved into *O P*, parallel to the ground, and *P H* perpendicular to the ground; *O P* expresses the force due to the wind, with which the kite pushes horizontally, and *P H* the force by which it rises upward. By so much as the point *E* of the string approaches nearer to *D*, *O P* will decrease; therefore, the point *E* ought not to be fixed, but should be movable with respect to *D* according as the wind varies, for, if the wind blows gently, the point *E* should stay at the place where the angle, *D E C*, is 54° 34′, but if the wind blows violently, the point *E* is not proper, since the wind will tear the paper or break the string, *E M*; in this case the point *E* should be moved nearer to *D*, by which arrangement it is possible so to set the kite that the raging tempest shall neither tear it nor break the string, *E M*, or, if the kite is used by the philosopher to observe the electricity of the upper air, the slender iron wire, *E M*, will remain unbroken. Again, three forces are operative in the flying kite, viz, the pressure of the wind, the weight of the kite with its appended tail, and the pull by the sustaining hand, *M*. Therefore, if *L G* be a perpendicular to the string, *L N* parallel to the ground or perpendicular to the direction of gravity, and *G N* perpendicular to the direction of the wind, this triangle, *G L N*, expresses the magnitude of these three forces. Of these *G L* will be the pull on the string, *L N* the weight of the kite, *G N* the force of the wind; but, furthermore, on account of the curvature of the string, which is a catenary, *G L* differs at every intermediate point between *E* and *M*; whence it is evident that the strength of the string should be greater near the kite, at *E*, and less nearer *M*, and, therefore, the string rarely breaks near *M*, but in some intermediate place.

Article DLXXIV. It is now easy to see by what means ships driven by the same wind are made to describe very various paths. * * *

The author goes on to describe the play of forces involved in the sailing of a vessel, but we do not need to take up the subject.

DR. THOMAS YOUNG ON THE KITE.

The next reference to this subject is found in Dr. Thomas Young's course of Lectures on Natural Philosophy, London, 1807, Vol. I, p. 324, in the following words:

A kite affords a very familiar example of the effect of the oblique impulse of the air, of which the action first causes a pressure perpendicular to the surface of the kite, and this force combined with the resistance of the string, produces a vertical result capable of counteracting the weight of the kite.

Young's figure, 294, Plate XXII is reproduced in our Fig. 3, Chart VII. His explanation accompanying this diagram says:

A kite supported by the wind of which the force acts nearly in the line, *A B*, perpendicular to the surface of the kite, and this compounded with the force of the cord, *A C*, produces the resultant *A D*, which sustains the weight of the kite.

It is evident that Young has by construction forced the resultant *A D* to be vertical, which is only the case when the head resistance is properly counterbalanced. He assumes that *A* is the common center of pressure, center of gravity, and point of application of the pull on the line and that there is no component of the wind force in the plane of the kite; nevertheless, so far as he goes into the details of the complex interaction of forces his analysis is an improvement on Musschenbroek.

BRANDES ON THE KITE.

After the above writings we find nothing on the theory of the kite until we come to the article by Brandes in the second volume of the third edition of Gehler's *Physikalisches Worterbuch*, published at Leipsic in 1826. A few words are given by Brandes as to the early history of the kite. It was described as a plaything by Daniel Schwenter (*Mathematische Erquickstunden*, Nurnberg, 1651, Part I, p. 472), who also showed how to construct a kite in imitation of a real dragon, and in this matter referred to an earlier author, Jacob Wecker (*In Secretis*, p. 187). Brandes refers to Musschenbroek's explanation of the action of the wind on the kite, which we have just given in full, and then goes on to give an explanation which is apparently intended to be a reproduction from Musschenbroek, but as it varies somewhat from him, we will reproduce the following text of Brandes (his figure is reproduced in our Fig. 3, Chart VII):

Let the loose cord *D E C* [this is now technically termed the bridle—ED.] be fastened to the main rib, *A B*. If now at any point, *E*, of the bridle the main string, *E M*, be fastened and held in the hand at *M*, while the surface of the kite makes an acute angle, *O P H*, with the horizontal direction of the wind, *O P*, then the pressure of the wind, *O P*, against the center of gravity, *O*, may be decomposed into two parts, *O H* and *H P*. If now we assume that the kite is held fast by this string, *E M*, then the component, *O H*, of this pressure experiences a resistance that it can not overcome, so that the kite can only follow the force *P H*, and, therefore, must ascend, but not, however, with the whole

force of the wind, but only with the fraction, $P H \div P O$, of the whole wind. Therefore, the ascent of the kite can only become possible when the surface of the kite is exposed not directly to the wind, but like the sails of a windmill inclined to the wind and in this case the effect of the wind is greatest when the line drawn normal to the surface of the kite makes an angle of 54° 34′ with the direction of the wind. The string is, at the beginning, pulled hard and one runs with it against the wind in order to increase the pressure of the wind against the surface of the kite. Kites of this kind flown with a long string are driven by the wind to very considerable altitudes.

It is evident that Brandes' argument is defective. He seems to say that $P O$ represents the pressure of the wind against the center of the kite, but he does not represent $O P$ as being normal to the surface of the kite, and after he has resolved this into two elements, it is evident that one of these is normal, acting in the direction from O to H, while the other is parallel to $A B$ and acts in the direction from H toward P, consequently this latter component, instead of raising the kite, must drive it downward in the direction $H P$, and therefore bring it to the ground. The true analysis of the forces is as given by Musschenbroek and Young; the wind, when it strikes the surface of the kite, is deflected and can only move in the direction from A to B, and exerts both a small head pressure and a strong normal pressure upon the surface of the kite, therefore, $O H$ and $H P$ must represent these pressures, and it is $O P$ that must be resolved into vertical and horizontal elements. It is possible that Brandes was led into error by following the mistake of the draughtsman who copied Musschenbroek's figure, as the two figures are lettered alike and differ only in the perpendicularity of the line $P H$. We have reproduced them both in Figs. 1 and 3, respectively.

After describing the first experiments of Franklin and the remarkable work done by de Romas in applying the kite to electrical observations, followed by similar work by several others, Brandes mentions that Musschenbroek, in 1756 and 1757, raised a kite to an altitude of 700 feet above the ground, see Musschenbroek's *Introductio ad Philosophia Naturalem*, Tome I, page 295, and adds, finally:

> That Dr. John Cuthbertson has described a special, rather complicated arrangement, and illustrated it on a special copper plate engraving, for causing the kite to ascend with convenience and certainty. But small balloons filled with illuminating gas, such as can be made of considerable size out of gold beaters' skin would offer still better service.

In the Encyclopedia Britannica, eighth edition, Vol. VIII, 1855, page 608, Sir David Brewster, in speaking of the electrical kite, says:

> Mr. Cuthbertson sometimes found it necessary to use three kites all connected together. On one occasion, when he could collect no electricity from the atmosphere with a kite having a string 500 feet long, he succeeded in obtaining it by adding two other kites, each of which had strings of the same length. Mr. Cuthbertson likewise employed an apparatus for raising his kites, in which the strings were lengthened or shortened by coiling them around a drum.

It will be remembered that for these electrical experiments the kite string was rather loosely wound around by a light copper wire, for the purpose of conducting the electricity from the clouds as was at first supposed, although afterwards Cavallo perceived that electricity was also drawn from the air when no clouds were present, so that he introduced the idea of the electricity of the clear atmosphere as distinguished from that of the thundercloud; subsequent progress showed that we might consider the electricity as developed within the wire itself by the inductive action of either the earth or the atmosphere or the cloud and not necessarily conducted from cloud or air to the earth. For our present study, however, which is concerned only with the development of the kite as a mechanism, we note merely that the small height, 500 feet or more, attained was largely due to heavy weight carried by his kite string. We note also that Cuthbertson seems to have been the first after Alexander Wilson to attempt to reach great altitudes by means of a tandem of kites.

CAVALLO'S EXPERIMENTS WITH KITES.

The Editor regrets that he has not access to the original memoir by Cuthbertson, but, on the other hand, the following extracts from his contemporary, Tiberius Cavallo, give a good idea of the construction, use, and mechanical theory of the kite as it was then understood. These extracts are taken from the first chapter in Vol. II of A Complete Treatise on Electricity, in Theory and Practice, with original experiments, by Tiberius Cavallo, F. R. S., the fourth edition, in three volumes, London, 1795. There is nothing to show that this portion of this edition differs materially from the first edition published in 1777.

The first instrument that I made use of to observe the electricity of the atmosphere was an electrical kite, which I had constructed, not with a view to observe the electricity of the air (for this, I thought, was very weak and seldom to be observed), but as an instrument which could be occasionally used in time of a thunderstorm in order to observe the electricity of the clouds. The kite, however, being just finished, together with its string, which contained a brass wire through its whole length, I raised it on the 31st of August, 1775, at seven of the clock in the afternoon, the weather being a little cloudy, and the wind just sufficient for the purpose. The extremity of the string being insulated I applied my fingers to it, which, contrary to my expectations, drew very vivid and pungent sparks; I charged a coated phial at the string several times, but I did not then observe the quality of the electricity. This successful experiment induced me to raise the kite very often and to keep it up for several hours together, thinking that if any periodical electricity or any change of its quality took place in the atmosphere it might very probably be discovered by this instrument. In the following two chapters I shall describe the construction of the electrical kite, with its appurtenances; and shall transcribe the most remarkable part of my journal relative to the kite, *i. e.*, describing such experiments only as are most remarkable and do not happen very commonly; for although I have used my kite sometimes ten and more times in a week, and at any hour of the day or night, yet as the greatest part of those experiments are only of use to confirm a few laws of atmospherical electricity, I shall omit their particular detail, and shall only subjoin those laws at the end of the second chapter.

The first electrical kite that I constructed was 7 feet high, and it was made of paper, with a stick or straighter, *i. e.*, a central rib and a canebow, like the kites commonly used by schoolboys. On the upper part of the straiter I fixed an iron spike, projecting about a foot above the kite, which I then thought was absolutely necessary to collect the electricity; and I covered the paper of the kite with turpentine, in order to defend it from the rain. The kite, perfect as I thought it to be in its construction, and fit for the experiments for which it was intended, soon manifested its imperfections, and after having been raised a few times, it became quite unfit for further use; it being so large, and consequently heavy, that it could not be used, except when the wind was strong, and then, after much trouble in raising and drawing it in, it often received some damage, which soon obliged me to construct other kites upon a different plan, in order to ascertain which method would answer the best for my purpose. I gradually lessened their size, and varied their form, till I observed, upon trial that a common schoolboy's kite was as good an electrical kite as mine. In consequence of which I constructed my kites in the most simple manner, and in nothing different from the children's kites, except that I covered them with varnish, or with well-boiled linseed oil, in order to defend them from the rain; and I covered the back part of the straiter with tinfoil, which, however, has not the least power to increase its electricity. I also furnish the upper extremity of the straiter with a slender wire pointed, which, in time of a thunderstorm, may perhaps draw the electricity from the clouds somewhat more effectually; but, in general, I find, as it will appear in the account of the experiments, that it does not in the least affect the electricity at the string. The kites that I have generally used are about 4 feet high and little above 2 feet wide. This size, I find, is the most convenient, because it renders them easy to be managed, and, at the same time, they can draw a sufficient quantity of string. As for silk or linen kites, they require a good deal of wind to be raised; and then they are not so cheap, or so easy to be made, as paper kites are. The string sometimes breaks, and the kite is lost or broken; for which reason these kites should be made as cheap and as simple as possible.

The string is the most material part of this apparatus, for the electricity produced is more or less, according as the string is a better or a worse conductor. The string which I made for my large kite consisted of two threads of common twine, twisted together with a brass wire between the strands. This string served very well for two or three trials, but on examination I soon found that the wire in it was broken in many places, and it was continually snapping; the metallic continu-

ation, therefore, being so soon interrupted, the string soon became so bad that it acted nothing better than common twine without a wire. I attempted to mend it by joining the broken pieces of wire, and working into the twine another wire, which proved a very laborious work, but the remedy had very little effect, the wire breaking again after the first trial, which determined me to adopt other methods, and, after several experiments I found that the best string was one which I made by twisting a copper thread[1] with two very thin threads of twine. Strings like this I have used for the greatest part of my experiments with the kite, and I find them to be exceedingly useful and fit for the purpose. Silver or gold threads would do much better to twist with the twine because they are much thinner than copper thread, and in consequence, the string would be much lighter, but at the same time it is to be considered that gold or silver thread is much dearer than copper thread.

I have attempted to render the twine a good conductor of electricity by covering it with conducting substances, as lamp black, powder of charcoal, very fine emery, and other substances, mixing them with diluted gum water; but this method improves the string very little, and for a short time, for the said conducting substances are soon rubbed off the twine. Mr. Nairne informed me that he used to soak the string of his electrical kite in a strong solution of salt, which rendered it a good conductor, so far as it attracted the moisture of the air. In consequence of this information I soaked in salt water a long piece of twine, and by raising a kite with it I found that it conducted the electricity pretty well, but I thought it much inferior to the above-described string with the copper thread, besides the salted string in wet weather not only leaves part of the salt upon the hands of the operator, and in consequence renders them unfit to manage the rest of the apparatus, but it marks a white spot wherever it touches the clothes.

In raising the kite when the weather is very cloudy and rainy, in which time there is fear of meeting with great quantity of electricity, I generally use, to hang upon the string, the hook of a chain, the other extremity of which falls upon the ground. Sometimes I use another caution besides, which is to stand upon an insulating stool, in which situation I think that if any great quantity of electricity, suddenly discharged by the clouds, strikes the kite, it can not much affect my person. As to insulated reels and such like instruments that some gentlemen have used to raise the kite without danger of receiving any shock, fit for the purpose as they may appear to be in theory, they are yet very inconvenient to be managed. Except the kite be raised in time of a thunderstorm, there is no great danger for the operator to receive any shock. Although I have raised my electrical kite hundreds of times without any caution whatever, I have very seldom received a few exceedingly slight shocks in my arms. In time of a thunderstorm, if the kite has not been raised before, I would not advise a person to raise it while the stormy clouds are just overhead, the danger in such time being very great, even with the precautions above mentioned. At that time, without raising the kite, the electricity of the clouds may be observed by a cork-ball electrometer held in the hand in an open place, or, if it rains, by my electrometer for the rain, which will be described hereafter.

The experiments made by Cavallo with the above kite are given in full from September 2, 1775, to January 8, 1777, from which we cull only the following: He demonstrates that it was the string and not the kite that collects the electricity from the air, and, again, that for the same length of string the index of his electrometer rose higher in proportion as the kite came nearer to the zenith, but the angular distance from the zenith is not given, so that we can not infer anything as to the angle of efficiency of his kites.

MEXICAN CLIMATOLOGICAL DATA.

Through the kind cooperation of Senor Mariano Bárcena, director, and Senor José Zendejas, vice-director, of the Central Meteorologico-Magnetic Observatory, the summaries of Mexican data for the months of January and February have been communicated in manuscript, in advance of their publication in the *Boletin Mensual;* an abstract translated into English measures is here given in continuation of the similar tables published in the MONTHLY WEATHER REVIEW during 1896. The altitudes occasionally differ from those heretofore published, but no reason has been assigned for these changes. The barometric means have not been reduced to standard gravity, but this correction will be given at some future date when the pressures are published on our Chart III.

[1] I mean such a thread of copper as is used for trimmings, etc., in imitation of gold threads, which are nothing more than silk or linen threads covered with a thin lamina of copper.

Mexican data for January, 1897.

Stations.	Altitude.	Mean barometer.	Temperature. Max.	Min.	Mean.	Relative humidity.	Precipitation.	Prevailing direction. Wind.	Cloud.
	Feet.	*Inch.*	° *F.*	° *F.*	° *F.*	%	*Inch.*		
Aguascalientes	6,112	23.80	73.4	35.6	55.4	50	4.72	n.	sw.
Campeche									
Colima (Seminario)	1,663				73.2				
Colima									
Culiacan	112								
Guadalajara (O. d. E.)	5,141	24.98	79.9	34.2	57.7	86	0.19	nnw.	w.
Guanajuato	6,761								
Jalapa	4,757	25.56	88.2	41.5	57.7	85	2.93	n.	
Lagos (L. G.)	6,275	24.14	77.9	28.7	55.0	57	0.63	sw.	sw.
Leon	5,901	24.30	76.8	34.3	56.8	50	0.50	ssw.	sw.
Magdalena (Sonora)	4,948				52.3		6.46	s.	w.
Mazatlan	25								
Merida	50	30.01	91.2	54.5	72.0	74	2.95	ne.	se.
Mexico (Obs. Cent.)	7,472	23.06	74.5	37.0	55.9	49	0.15	sw.	sw.
Mexico (E. N. de S.)	7,480								
Monterey	1,626	28.24	77.0	23.9	55.4	77	1.44	ne.	ne.
Morelia (Seminario)	6,401	23.96	75.1	37.4	55.6	63	0.72	ssw.	w.
Oaxaca	5,164	25.10	82.6	39.4	63.3	56	T.	nw.	
Pabellon	6,312								
Pachuca	7,956	22.54	80.2	34.9	54.0	59	0.22	nne.	sw.
Puebla (Col. d. Est)	7,118								
Puebla (Col. Cat.)	7,112	23.38	76.1	39.9	56.8	46	0.04	ese.	sw.
Queretaro	6,070								
Real del Monte	9,095								
Saltillo (Col. S. Juan)	5,377	24.89	74.8	21.2	50.4	67	3.66	n.	n.
San Jacinto (E.N.d A.)	7,438								
San Luis Potosi	6,202	24.13	73.0	37.4	54.1	68	1.04	sw.	w.
Silao	6,063	24.28	72.7	44.8	59.0	62	0.44		
Tacámbaro									
Tacubaya (Obs. Nac.)	7,620								
Tampico (Hos. Mil.)	38								
Tehuacan	5,453								
Toluca	8,812	21.89	71.4	31.6	50.2	54	0.33	se.	
Trejo (H.de, S., Gto.)*	6,011						0.46		
Trinidad†	6,011								
Veracruz	48								
Zacatecas	8,015	22.49	75.2	29.8	51.8	52	1.24	sw.	sw.
Zapotlan (Seminario)	5,125	25.08	80.6	44.4	62.4	62	0.42	se.	sw., se.

*Trejo appears to have the same altitude as the next station, Trinidad, but this may be a typographical error as in the December *Boletin*. See MONTHLY WEATHER REVIEW, January, 1897, page 17.

†Trinidad is 14 kilometers east-southeast of Leon.

Mexican data for February, 1897.

Stations.	Altitude.	Mean barometer.	Temperature. Max.	Min.	Mean.	Relative humidity.	Precipitation.	Prevailing direction. Wind.	Cloud.
	Feet.	*Inch.*	° *F.*	° *F.*	° *F.*	%	*Inch.*		
Aguascalientes	6,112								
Campeche									
Colima (Seminario)	1,663	28.29	96.4	46.8	72.1	61	0.03	wsw.	sw.
Colima					74.3				
Culiacan	112	29.81	90.1	50.0	60.7	58	0.00		
Guadalajara (O. d. E.)	5,141	24.98	87.3	35.8	62.4	79	0.00	sw.	sw.
Guanajuato	6,761								
Jalapa	4,757	25.52	77.0	55.4	64.6	72	0.72	se.	
Lagos (L. G.)	6,275	24.13	87.8	30.2	59.0	42	T.	nw.	sw.
Leon	5,901	24.29	84.2	34.7	60.4	36	T.	sw.	sw.
Magdalena (Sonora)	4,948				54.9		0.24	n.	n.
Mazatlan	25	29.96	77.4	54.9	69.8	70	0.00	nw.	sw.
Merida	50	29.94	95.2	53.6	77.0	70	0.03	se.	se.
Mexico (Obs. Cent.)	7,472	23.06	73.9	46.9	60.1	41	0.00	se.	sw.
Mexico (E. N. de S.)	7,480								
Monterey	1,626	28.09	96.0	41.0	65.8	59	T.	ne.	ne.
Morelia (Seminario)	6,401	23.96	85.8	38.5	61.9	52	0.00	ssw.	wsw.
Oaxaca	5,164	25.06	90.0	42.2	67.5	55	0.00	nw.	ne.
Pabellon	6,312								
Pachuca	7,956								
Progreso									
Puebla (Col. d. Est.)	7,118								
Puebla (Col. Cat.)	7,112	23.37	83.3	38.8	61.0	44	0.00	e.	sw.
Queretaro	6,070								
Real del Monte	9,095								
Saltillo (Col. S. Juan)	5,377	24.78	85.3	37.7	58.3	50	0.04	s.	sw.
San Jacinto (E.N.d.A.)	7,438	23.05	72.1	37.8	59.5	47	0.00	sw.	n. w.
San Luis Potosi	6,202	24.11	81.5	39.6	60.8	63	T.	sw.	w.
Silao	6,063	24.28	79.7	43.3	62.8	50	T.	nw.	sw.
Tacambaro									
Tacubaya (Obs. Nac.)	7,620								
Tampico (Hos. Mil.)	38								
Tehuacan	5,453								
Toluca	8,812	21.93	76.6	28.6	54.5	48	0.00	sw.	
Trejo (H. d. S., Gto.)	6,011						0.00		
Trinidad	6,011								
Vera Cruz	48								
Zacatecas	8,015	22.50	68.5	42.3	55.6	42	0.00	sw.	
Zapotlan (Seminario)	5,125	25.08	87.4	43.5	65.1	48	0.05	sse.	sw.

CHEMICAL COMPOSITION OF THE UPPER AIR.

The second series of simultaneous balloon ascensions in the interest of meteorology was carried out on the 18th of February. The balloon, L'Aerophile, which ascended at

Paris to a remarkable altitude, as it has done on several previous occasions, carried a special apparatus which was moved by clockwork and which allowed a vacuum chamber to be opened, filled with air, and closed when the balloon was at or near its maximum height. The volume of the reservoir was about 6 liters, the altitude at which it was filled was 15,500 meters; the barometric pressure recorded at the time of filling was 140 millimeters. The experiment appears to have been completely successful, every source of trouble in the apparatus having been anticipated and provided for. A complete description of the apparatus and results is given by M. Cailletet in the *Comptes Rendus*, of the Academy of Sciences, Paris, March 8, 1897, from which we take the following account of the results of the chemical analysis. This analysis was entrusted to Müntz, who reported that the volume of about 6 liters of air secured at 15,500 meters, at a pressure of 140 milimeters and a probable temperature of about minus 66°, occupied a volume of 1.18581 liter when reduced to the standard pressure of 760 mm. and a temperature of 0° C. 100 volumes of this air contained 0.033 volume of carbonic acid gas; after being deprived of its carbonic acid gas, 100 volumes of this air contained 20.79 of oxygen, 78.27 of nitrogen, 0.94 of argon. The ratio of the argon to the sum total of the nitrogen and argon was 0.01185. M. Müntz adds the following remarks:

The results of the above analysis show, as was to have been anticipated, that at the altitude attained in this case, the chemical composition of the air does not differ notably from that of the lower strata, but these figures can only be accepted with some reserve; it is, in fact, necessary to still further perfect the method of securing the specimen of air so as to avoid any possible alteration in its composition. It will be necessary to employ for the lubrication of the stop-cock a mineral oil incapable of absorbing the slightest trace of oxygen or of emitting a trace of carbonic acid gas under the conditions that prevail in these experiments. It will also be necessary to make use of a vacuum chamber whose walls do not absorb a single trace of oxygen. In this respect a reservoir of glass would be ideal, but a reservoir of gilded copper would seem to me to equally fulfill the desired object. In the present case it is possible that the small proportion of carbonic acid gas, 0.033 in excess over that of normal air, 0.029, is due to the oxidation of the lubricant which could have furnished the tenth of a milligram corresponding to this excess. In the same way the small proportion of oxygen, 20.79, as compared with that of normal air, 20.96, and which for the volume of air collected represents 3 milligrams, could be due to the absorption of this gas by the lubricator and, especially, by the metallic walls of the tinned copper.

After eliminating all possible causes of error in this latest ascension we can decide with certainty whether or not there exist any real differences in the constitution of the air at various altitudes. For the methods of analyses with gases are to-day so perfect, thanks, especially to the labors of M. T. Schloesing, Jr., that excessively small differences would be shown if they existed, but, as is easily perceived, the air in the regions where it is actually possible to explore the atmosphere by means of the sounding balloon is subject to the effect of a stirring which renders its composition sensibly uniform with that of the lower strata; one ought, therefore, to expect only small differences in its composition, such as can only be demonstrated with certainty when the most minute precautions are taken. It will be easy to take account of the errors that are attributable to the retention of the air in its reservoir by introducing into the latter some air of known composition which can be analyzed at the end of a certain interval.

The Editor hopes that the above cautious remarks by so high an authority in science will serve to correct the sensational paragraphs that have been going the rounds of the newspapers to the effect that the results of this high ascension demonstrated that the composition of the atmosphere varies with increased altitude in such a way as to prove that a definite limit to the atmosphere exists at no great altitude above the earth and that this limit is diminishing.

METEOROLOGICAL NOTES BY CAPT. WM. SCORESBY, JR.

(*A*) STATIONARY CLOUDS ON MOUNTAIN TOPS.

In his journal of a voyage to the northern whale fishery and east coast of West Greenland, 1822 (Edinburgh, 1823), Scoresby says that he was on the 5th of September off the Faroe Islands, and remarks:

The tops of the higher cliffs of Kalsoc and Ostroe, it was remarked, were capped with clouds, which remained in a state of apparently calm repose upon the summits, while a breeze, little short of a gale of wind, carried all other clouds along with great velocity. This is a circumstance so common in these islands, and, indeed, in all mountainous countries, that it would scarcely have merited observation had it not formerly suggested to me an explanation of the phenomenon of the suspension of clouds, which, as far as I know, is new.[1] The force acting against the suspension of clouds is gravity, which, on account of the resistance that very minute substances, such as the almost invisible particles of vapor in clouds, meet with in their descent from the air, can be productive of no great velocity; but the force acting against the retention of clouds on the tops of mountains in boisterous weather is the wind, which may have a velocity of 50 miles an hour or upwards. Hence, whatever cause is sufficient for the retention of clouds upon mountains against the action of the wind must be sufficient (all other circumstances being the same) for the suspension of clouds in the air, where the tendency to quit their position is induced by a force perhaps not one-tenth so great as the former. In the case of the retention of clouds upon mountains, it might be objected that, notwithstanding a gale may be blowing in the lower parts of the atmosphere, the air on the tops of the mountains may be calm. It must be admitted that the various currents known to exist in the atmosphere at the same time in different strata might justify this supposition were there no facts that could be brought forward to prove the prevalence of the wind aloft as well as below in instances where the clouds were retained. These facts, indeed, being so much within every person's observation who has visited mountainous countries, scarcely requires an example. Two instances, however, may be given: On a former voyage, when the highest summit of Ostroe was observed to be covered with a stationary cloud during a strong gale, the lower atmosphere was full of those scattered clouds called by the sailors "scud," whose flight in storms is so striking and rapid. Some of these patches of cloud were evidently at the same level as that of the highest land, because in a large patch passing across the summit it was sometimes observed that a portion of it coalesced with the cloud reposing thereon, and the rest flew away, with undiminished velocity, to leeward. The other example that I have to mention relates to Ben Lomond. I ascended this mountain on a fine, clear day, in the month of October. There were, indeed, some flying clouds in the air, the wind being high, but these were small and few. The summit of Ben Lomond, however, was capped with a stationary cloud. This cloud proved to be of the nature of mist of the densest kind. The particles of vapor were remarkably small and were flying rapidly past me by the action of the wind. At the very top, indeed, the gale was so strong that I could scarcely keep my feet; yet the cloud steadily maintained its position for several hours. Now, as the cloud could not possibly remain stationary on the mountain without moving to windward with a velocity equal to that of the gale, a notion which it would be absurd to entertain, its apparent fixedness can only be attributed to progressive deposition of aqueous vapor, or formation, on the one hand, and to equal solution and dispersion, on the other. It is, therefore, absolutely certain that the stationary appearance of the cloud, in this instance, was the effect of condensation produced on the air as it approached the mountain and absorption as it receded from it, so that while the cloud seemed to a distant observer to be the same mass of vapour, neither varying in size nor form for a quarter of an hour together, it was in reality changing the whole of the particles of which it consisted perhaps every minute.

(*B*) GALES WITH RISING BAROMETER.

The strongest winds that are experienced in the United States may, perhaps, be classified as follows:

(*a*) Very local gusts attending thunderstorms and tornadoes; these are generally believed to be whirling and ascending winds, but this is not invariably the case, since for every descending mass of air there must be a corresponding ascending mass; at or near the surface of the earth the destructive gusts are more likely to be descending.

(*b*) Severe whirlwinds, which are certainly revolving winds, and on a much larger scale than in the tornado.

(*c*) Local straight-line winds, which Hinrichs calls "derechos;" these usually attend cyclonic storms, and, apparently, consist of denser cool or dry air descending to the ground.

(*d*) Straight-line winds on a larger scale, known as "northers," "northwesters," or "blizzards," which are also cold, dry, heavy air pushing outward and especially southward from an area of high pressure, and, probably, also slowly descending.

[1] The first observation of this circumstance occurred in 1820, while passing the Faroe Islands in a gale of wind. The theory of the suspension of clouds that was suggested by it was first communicated to the Liverpool Society of Travelers into Foreign Countries about two years ago.

When gales of this latter class reach any station the barometric pressure generally rises rapidly, whereas in gales of the class (*b*) the pressure first falls rapidly and then rises. Whirlwinds, viz, gales attending low pressures, had long been known to navigators throughout the tropical and equatorial regions, but northwesters, with rising barometer, were not well recognized by English navigators until the present century. The younger Scoresby, in his journal of a voyage on the eastern coast of west Greenland (Edinburgh, 1823, p. 358), says:

It is observable that the barometer (September 3, 1822), which had been at 28.35 for upwards of thirty hours before the commencement of the gale, began to rise the moment the gale attained its height. It rose about .4 of an inch in a very short interval. This rising of the mercury at the commencement of a storm is a circumstance that I have frequently observed. It is not indicative, however, either of a short duration or an approaching cessation of the gale, for after such a rise I have known many gales to continue for thirty or forty hours unabated.

OPENING OF NAVIGATION IN CANADA.

The following table, showing the average date of the opening of navigation at Canadian ports during the past twenty years, is published by Prof. R. F. Stupart on "The Monthly Weather Map" for February, 1897:

Canadian Ports.	Dates of opening.		
	Earliest.	Latest.	Average.
Lake Superior: Port Arthur	Mar. 18	May 22	Apr. 26
St. Marys River: Sault Ste. Marie	Apr. 8	May 12	Apr. 27
St. Claire River: Sarnia	Mar. 7	May 3	Apr. 5
Lake Erie: Port Colborne	Apr. 15	May 9	Apr. 25
Lake Ontario: Burlington Bay	Mar. 1	Apr. 28	Apr. 11
Lake Ontario: Toronto	Feb. 13	Apr. 25	Mar. 28
Lake Ontario: Kingston	Mar. 6	Apr. 24	Apr. 5
St. Lawrence River: Montreal	Mar. 30	May 5	Apr. 21

ANNOUNCEMENT BY THE SECRETARY OF AGRICULTURE.

UNITED STATES DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C., March 23, 1897.

To the Chiefs of the Scientific Divisions of the U. S. Department of Agriculture:

Dr. Charles W. Dabney, Jr., of Tennessee, has this day been appointed as "Special Agent in charge of Scientific and Statistical Investigations" in this Department.

It will be the duty of this special agent to consider, for the information of the Secretary of Agriculture, the scientific and technical work of the divisions of this Department specified below, to supervise the same under his direction, and to make recommendations respecting their scientific work, reports, papers, etc., for his action.

The following divisions and offices are hereby directed to report to the Secretary through this special agent:

Division of Forestry.
Division of Botany.
Division of Vegetable Physiology and Pathology.
Division of Agrostology.
Division of Pomology.
Division of Chemistry.
Division of Biological Survey.
Division of Soils.
Division of Entomology.
Office of Experiment Stations.
Office of Fiber Investigations.
Section of Foreign Markets and Special Statistical Investigations, Cotton, and Tobacco.

All questions and official correspondence involving the scientific and technical work of said divisions and offices will be submitted to this special agent for approval and signature, unless such correspondence involves administrative policy, in which case it will be signed by the Secretary.

JAMES WILSON,
Secretary of Agriculture.

METEOROLOGICAL TABLES.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

For text descriptive of tables and charts see page 20 of REVIEW for January, 1897.

TABLE I.—*Climatological data for Weather Bureau Stations, February*, 1897.

Stations.	Elevation of instruments.			Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.											Precipitation, in inches.			Wind.					Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Total snowfall.
	Barometer above sea level, feet.	Thermometers above ground.	Anemometers above ground.	Mean actual, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Departure from normal.	Mean max. and min. + 2.	Departure from normal.	Maximum.	Date.	Mean minimum.	Minimum.	Date.	Greatest daily range.	Mean wet thermometer.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Total.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.				
New England.							28.7	+ 1.1										2.20	— 1.3										
Eastport	76	69	74	29.94	30.03	+ .07	23.4	+ 0.9	44	8	30	0	12	17	23	21	16	72	1.45	— 2.3	10	8,249	nw.	48	ne.	23	11	10	7	5.0	12.6
Portland, Me	103	81	89	29.92	30.03	+ .02	25.0	+ 2.3	45	8	34	6	28	18	26	22	17	72	2.60	— 0.9	7	5,083	nw.	38	se.	7	11	9	8	5.0	19.1
Northfield	872	15	59	29.11	30.11	+ .05	18.3	+ 1.2	43	7	29	—15	27	8	46	15	10	76	1.53	— 0.6	11	5,386	n.	32	s.	21	4	13	11	6.6	14.1
Boston	125	115	181	29.93	30.07	+ .02	30.9	+ 3.1	52	21	38	12	28	24	24	27	22	71	2.12	— 1.4	6	7,992	nw.	32	n.	3	13	4	11	5.1	10.9
Nantucket	14	43	54	30.04	30.05	— .04	32.5	+ 1.3	47	7	36	21	28	28	14	30	27	80	2.69	— 0.2	11	8,903	nw.	47	ne.	3	12	4	12	6.0	12.8
Woods Hole	.....	51	57	.....	.....	.....	31.1	— 0.2	43	7	35	18	13	27	17	....	....	....	1.96	— 1.7	9	10,279	sw.	45	n.	3	15	3	10	4.2	10.1
Vineyard Haven	.....	20	....	.....	.....	.....	33.6	+ 0.3	50	18	39	18	13	28	20	....	....	....	2.68	— 0.5	9	.....	nw.	....	.....	....	13	5	10	....	11.4
Block Island	37	39	48	30.05	30.08	+ .01	31.8	+ 0.3	44	7	36	18	13	28	14	29	25	75	2.83	— 1.5	11	11,939	nw.	70	ne.	3	7	10	11	5.7	6.8
Narragansett Pier	.....	10	....	.....	.....	.....	29.8	+ 0.7	45	21	37	9	*	23	29	....	....	....	3.02	— 1.5	6	.....	w.	....	.....	....	12	3	13	....	11.0
New Haven	107	118	140	29.96	30.08	— .01	30.0	+ 1.5	51	21	37	9	1	23	29	26	20	67	2.00	— 2.1	7	7,194	n.	56	e.	6	14	3	11	4.9	12.1
Mid. Atlan. States.							36.2	+ 0.1										4.09	+ 0.7										
Albany	97	84	113	30.01	30.12	+ .04	26.0	— 0.2	48	21	34	— 5	14	18	31	23	19	78	2.05	— 0.6	10	5,582	n.	32	se.	21	6	12	10	6.4	9.4
Binghamton	875	79	90	.....	.....	.....	26.1	.....	50	17	34	— 6	1	18	49	....	....	....	1.37	.....	10	4,611	nw.	38	se.	6	5	9	14	7.0	12.9
New York	314	298	336	29.74	30.09	— .03	32.6	+ 0.4	53	21	38	17	27	27	21	29	25	76	2.72	— 1.1	9	9,383	nw.	60	e.	6	5	11	12	6.4	8.8
Harrisburg	377	94	102	29.69	30.12	— .04	32.1	— 0.4	48	18	38	15	1	27	23	29	23	69	2.77	0.0	11	5,461	nw.	34	nw.	24	5	4	19	7.5	9.0
Philadelphia	117	168	184	29.97	30.10	— .03	35.8	+ 1.3	53	18	41	18	27	30	20	32	28	76	2.97	— 0.2	14	7,405	nw.	46	ne.	2	6	7	15	6.4	6.4
Atlantic City	53	68	76	30.04	30.09	— .01	34.8	+ 0.8	54	18	40	18	28	29	17	32	29	81	2.96	— 0.4	12	8,421	nw.	52	ne.	2	5	11	12	6.2	3.2
Baltimore	123	68	82	29.96	30.10	— .04	36.8	— 0.2	56	*	43	18	1	31	32	32	28	74	5.13	+ 1.6	13	3,840	w.	30	n.	2	7	5	16	6.7	0.7
Washington	112	59	76	29.98	30.11	— .03	36.6	+ 0.5	63	17	44	12	1	29	32	33	30	80	6.47	+ 3.1	14	5,035	n.	36	n.	2	9	2	17	6.1	6.0
Cape Henry	.....	5	34	.....	.....	.....	41.9	— 1.3	70	18	48	22	28	36	28	....	....	....	3.98	+ 0.4	11	.....	se.	....	.....	....	8	6	14	....	T.
Lynchburg	688	83	88	29.34	30.11	— .03	40.6	— 0.3	71	18	49	14	1	32	36	36	31	72	7.84	+ 4.3	14	3,094	nw.	22	nw.	2	12	4	12	5.7	0.5
Norfolk	57	88	93	30.02	30.09	— .05	44.4	+ 0.7	72	18	52	26	28	36	30	40	37	85	4.03	+ 0.2	14	5,589	ne.	40	se.	6	9	6	13	5.5	T.
S. Atlantic States.							51.2	+ 0.5										7.03	+ 3.3										
Charlotte	773	67	76	29.22	30.07	— .08	46.4	+ 0.5	74	22	55	25	28	38	25	41	36	73	5.44	+ 0.9	13	5,388	s.	34	sw.	22	11	6	11	5.8	
Hatteras	11	17	36	30.07	30.08	— .05	47.6	— 0.1	67	21	53	32	28	42	23	45	43	87	5.21	+ 0.7	13	9,740	n.	48	n.	16	6	7	15	6.9	
Kittyhawk	9	12	30	30.05	30.06	— .07	44.8	— 0.7	78	23	51	28	28	38	34	43	41	87	7.72	+ 4.0	10	9,887	ne.	60	n.	3	10	8	10	5.4	
Raleigh	375	93	101	29.68	30.09	— .09	46.3	+ 1.3	75	22	55	25	28	38	32	41	37	74	4.42	+ 0.4	11	5,005	sw.	29	sw.	23	9	7	12	6.0	
Wilmington	78	82	88	30.00	30.09	— .05	52.0	+ 1.3	77	23	60	30	28	44	30	46	44	83	6.26	+ 3.0	11	6,195	ne.	42	s.	6	10	7	11	5.4	
Charleston	48	60	72	30.06	30.11	— .04	55.0	+ 1.3	74	18	61	38	28	49	22	49	46	78	7.61	+ 4.3	12	8,015	sw.	56	se.	6	8	10	10	5.7	
Columbia	.....	5	....	.....	.....	.....	50.6	+ 0.6	79	22	60	25	28	41	25	....	....	....	9.11	+ 4.9	12	.....	w.	....	.....	....	9	8	11	....	
Augusta	180	89	103	29.89	30.08	— .09	52.2	+ 0.2	75	18	61	27	28	43	32	46	42	76	8.57	+ 4.6	13	4,543	w.	27	w.	2	11	5	12	5.7	
Savannah	98	63	86	29.99	30.10	— .07	56.6	+ 0.8	81	23	65	32	28	48	28	52	49	84	8.85	+ 5.8	13	6,186	nw.	27	se.	5	9	4	15	6.5	
Jacksonville	43	69	84	30.05	30.10	— .05	60.0	+ 0.2	84	22	68	34	28	52	26	55	53	86	7.10	+ 4.0	13	5,682	s.	42	se.	5	9	7	12	5.9	
Florida Peninsula.							69.1	+ 2.2										3.87	+ 1.5										
Jupiter	28	13	30	30.08	30.11	— .03	69.4	+ 2.2	86	25	75	46	3	64	22	64	62	83	5.14	+ 2.6	8	7,515	s.	51	se.	5	10	12	6	4.8	
Key West	22	42	50	30.09	30.11	— .01	72.7	+ 0.9	82	23	77	58	4	68	15	68	66	81	1.06	— 0.6	3	6,387	se.	48	nw.	5	18	8	2	3.4	
Tampa	36	60	68	30.07	30.11	— .03	65.2	+ 3.4	82	19	72	39	28	58	27	61	59	86	5.40	+ 2.6	9	5,347	s.	30	sw.	5	10	15	3	4.2	
East Gulf States.							54.8	— 0.7										5.70	+ 1.2										
Atlanta	1,131	92	125	28.88	30.11	— .07	47.7	— 0.3	74	22	55	32	27	40	29	43	39	79	4.59	— 0.4	13	7,663	nw.	37	e.	1	7	6	15	6.2	T.
Pensacola	56	78	90	30.03	30.09	— .07	56.8	— 0.4	74	20	63	32	28	50	32	53	50	82	10.26	+ 6.4	14	7,109	sw.	42	s.	5	8	12	8	5.8	
Mobile	57	88	96	30.03	30.09	— .06	55.3	— 0.2	76	22	63	32	28	48	27	51	48	84	7.70	+ 3.0	13	5,974	s.	30	s.	22	6	6	16	7.0	
Montgomery	221	100	107	29.84	30.08	— .08	54.0	+ 0.5	80	22	62	27	28	46	34	49	45	78	5.65	+ 0.3	12	5,092	se.	32	nw.	22	11	10	7	4.8	
Vicksburg	254	65	73	29.77	30.04	— .11	54.2	+ 0.8	78	18	63	31	2	46	27	48	43	70	2.67	— 2.0	10	5,168	se.	29	s.	7	12	8	8	4.8	
New Orleans	54	112	120	30.02	30.08	— .04	58.0	— 0.5	81	18	66	37	1	50	26	53	50	81	4.82	+ 0.3	10	6,584	ne.	33	s.	22	4	7	17	7.6	
Port Eads	.....	27	....	.....	.....	.....	57.4	— 4.5	75	20	64	37	2	50	26	....	....	....	4.19	+ 0.9	10	.....	ne.	....	.....	....	4	2	22	....	
West Gulf States.							54.3	+ 1.9										0.77	— 2.7										
Shreveport	249	77	84	29.76	30.03	— .10	54.0	+ 2.2	81	18	63	31	2	44	32	47	40	66	0.43	— 3.7	5	5,606	se.	28	nw.	7	10	4	14	5.7	0.5
Fort Smith	481	63	72	29.49	30.03	— .09	46.2	+ 3.1	82	21	55	20	27	37	37	40	34	69	0.45	— 3.2	4	5,850	e.	28	ne.	7	10	7	11	5.5	
Little Rock	302	71	79	29.73	30.06	— .08	46.8	+ 0.6	78	17	55	21	27	39	32	41	35	69	1.76	— 3.6	8	5,450	e.	28	sw.	13	7	7	14	6.7	T.
Corpus Christi	30	42	50	30.00	30.02	— .09	61.4	+ 2.5	84	22	68	32	1	55	28	57	56	88	0.06	— 2.4	3	7,563	se.	31	n.	23	15	3	10	4.4	
Galveston	42	85	96	30.02	30.06	— .05	56.7	— 1.0	73	22	62	33	1	52	19	53	51	85	2.25	— 0.8	6	7,669	s.	28	ne.	22	11	5	12	5.5	
Palestine	510	54	61	29.49	30.05	— .08	55.2	+ 2.5	82	18	66	26	2	45	39	48	43	70	0.29	— 3.2	4	5,735	s.	24	s.	28	9	9	10	5.7	
San Antonio	704	95	104	29.28	30.03	— .09	59.9	+ 3.2	85	18	71	29	1	49	36	52	45	68	0.15	— 1.8	3	5,935	se.	60	n.	23	13	6	9	4.8	
Ohio Val. & Tenn.							39.6	+ 0.3										4.75	+ 0.6										
Chattanooga	762	106	112	29.27	30.10	— .05	47.0	+ 0.5	76	22	55	19	27	39	35	42	37	73	5.52	— 0.1	11	5,661	w.	37	w.	2	6	9	13	6.5	T.
Knoxville	980	80	88	29.02	30.09	— .07	45.6	+ 1.9	72	22	54	18	27	37	38	41	36	72	4.66	— 0.7	9	4,193	w.	32	sw.	21	6	7	15	6.7	T.
Memphis	399	140	154	29.62	30.06	— .09	46.4	+ 0.8	76	21	54	20	27	39	26	43	39	78	5.17	— 0.1	7	7,107	nw.	43	e.	5	7	10	11	6.1	0.1
Nashville	545	128	134	29.47	30.07	— .07	44.6	+ 1.7	76	21	53	14	27	36	32	40	36	76	3.84	— 1.4	13	5,052	nw.	29	sw.	21	8	7	13	6.0	T.
Lexington	989	75	122	28.97	30.07	— .05	37.4	+ 0.2	66	17	45	10	27	30	26	34	29	75	6.33	+ 2.8	14	8,090	ne.	42	nw.	15	6	4	18	7.4	1.5
Louisville	525	114	136	29.49	30.08	— .06	38.6	— 0.4	67	17	46	10	27	31	28	35	30	74	4.04	— 0.3	13	5,954	n.	30	sw.	15	6	5	17	7.2	0.8
Indianapolis	823	154	164	29.17	30.09	— .03	32.5	+ 0.4	58	17	38	3	27	26	22	31	26	78	2.37	— 1.2	10	6,822	ne.	38	w.	23	7	8	13	6.4	6.8
Cincinnati	628	152	157	29.39	30.10	— .04	36.4	— 0.3	63	17	43	9	27	30	25	32	27	70	5.27	+ 1.6	11	5,732	nw.	27	nw.	26	8	4	16	6.6	3.8
Columbus	824	87	100	29.17	30.09	— .03	34.0	+ 1.8	59	17	40	6	27	28	20	31	27	81	3.71	0.0	9	5,691	w.	25	w.	23	3	4	21	7.8	2.7
Pittsburg	842	116	126	29.16	30.10	— .03	35.0	+ 1.0	61	17	42	8	27	28	25	32	29	80	4.30	+ 1.5	12	4,616	w.	29	w.	23	3	10	15	7.6	3.8
Parkersburg	638	77	84	29.39	30.10	— .05	37.7	+ 0.8	63	15	45	11	27	31	26	34	30	78	7.04	+ 4.0	13	4,145	nw.	31	nw.	23	4	4	20	7.8	2.0
Lower Lake Region.							33.0	+ 1.3										1.65	— 1.1										
Buffalo	768	178	206	29.21	30.08	— .00	27.6	+ 3.1	45	22	33	6	28	22	22	26	21	76	3.13	+ 0.3	14	11,625	w.	59	w.	23	2	8	18	7.7	12.0
Oswego	335	76	87	29.69	30.08	— .01	25.2	+ 1.0	45	17	31	4	28	19	22	23	19	78	1.26	— 1.3	16	9,117	se.	40	w.	23	3	9	16	7.5	8.5
Rochester	523	81	90	29.48	30.07	— .02	26.9	+ 2.2	46	17	33	5	28	21	25	24	20	73	2.31	— 0.4	19	6,435	sw.	33	sw.	23	2	9	17	7.5	13.7
Erie	714	92	102	29.27	30.08	— .00	28.2	0.0	47	17	33	7	28	23	22	26	24	86	1.74	— 1.7	12	7,782	w.	45	s.	20	0	7	21	7.8	6.0
Cleveland	762	190	201	29.21	30.07	— .03	29.6	+ 1.4	52	17	35	4	27	24	23	27	24	81	1.52	— 1.3	15	9,455	w.	57	w.	23	4	2	22	8.2	5.1
Sandusky	629	62	74	29.37	30.08	— .02	30.4	+ 2.0	54	17	35	4	27	26	21	27	24	84	1.03	— 1.9	11	6,096	nw.	32	nw.	23	3	4	21	7.6	7.7
Toledo	674	122	127	29.33	30.09	— .00	28.8	+ 0.6	48	*	34	4	27	24	20	27	24	84	1.10	— 1.0	10	6,698	w.	38	nw.	23	2	9	17	7.6	6.2
Detroit	730	160	166	29.26	30.09	+ .01	27.4	+ 0.2	44	17	32	4	27	23	19	25	22	82	1.14	— 1.2	11	6,968	sw.	36	sw.	23	4	6	18	7.6	8.2
Upper Lake Region.							23.6	+ 4.2										1.57	— 0.4										
Alpena	609	61	65	29.36	30.06	— .01	23.0	+ 5.5	40	17	28	— 5	27	17	20	21	18	81	1.09	— 1.0	12	6,850	w.	38	e.	22	8	10	10	6.0	10.4
Grand Haven	628	55	64	29.34	30.06	— .01	27.8	+ 3.3	42	16	34	7	27	22	24	25	23	85	1.12	— 1.1	17	7,418	e.	36	sw.	14	1	5	22	8.8	10.9
Marquette	734	67	95	29.20	30.03	— .03	20.9	+ 5.4	36	20	27	—10	27	15	21	19	16	86	1.66	— 0.1	21	5,707	nw.	40	se	13	3	2	23	8.3	20.1
Port Huron	639	70	108	29.37	30.10	+ .02	25.8	+ 3.3	38	6	30	1	27	22	19	24	21	81	1.40	— 1.0	16	7,444	w.	40	w.	23	4	8	16	6.9	9.9
Sault Ste. Marie	634	58	65	29.34	30.06	.00	17.2	+ 3.8	36	3	25	—21	26	10	26	16	13	84	0.94	— 0.4	10	5,981	se.	38	se.	13	7	9	12	6.3	10.3
Chicago	824	241	274	29.16	30.09	.00	28.6	+ 0.9	44	13	34	— 6	27	24	20	27	24	80	2.22	0.0	10	11,158	w.	51	e.	21	5	7	16	7.1	14.6
Milwaukee	671	106	149	29.32	30.08	— .01	27.2	+ 4.2	41	13	32	— 7	27	22	22	25	21	80	1.78	— 0.1	9	7,801	w.	44	e.	22	4	5	19	7.8	17.1
Greenbay	617	49	57	29.38	30.09	— .01	23.2	+ 6.2	40	13	29	—14	27	17	22	20	16	76	1.69	— 0.6	13	5,761	n.	34	sw.	14	4	13	11	6.5	17.6
Duluth	702	95	106	29.24	30.05	— .04	18.6	+ 5.6	34	20	24	—20	26	13	27	17	15	87	2.21	+ 1.1	14	6,691	ne.	45	nw.	21	7	9	12	6.5	22.9
North Dakota.							6.9	— 0.7										1.31	— 0.7										
Moorhead	935	54	60	28.99	30.09	— .06	7.8	+ 2.9	33	20	17	—30	26	— 2	38	7	6	92	1.52	+ 0.7	12	7,420	se.	45	nw.	13	9	7	12	6.0	13.6
Bismarck	1,674	16	29	28.16	30.10	— .06	6.6	— 2.5	33	16	17	—25	26	— 4	46	5	0	71	1.32	+ 0.8	14	5,530	nw.	48	nw.	16	8	10	10	5.7	13.2
Williston	1,875	15	31	27.93	30.08	— .09	6.3	— 2.6	32	*	17	—25	26	— 4	46	6	3	83	1.10	+ 0.7	8	5,191	nw.	60	nw.	16	12	12	4	4.1	11.0
Upper Miss. Valley.							28.1	+ 2.8										1.58	— 0.3										
Minneapolis	.....	90	....	.....	.....	.....	20.0	+ 4.1	37	1	27	—21	26	13	30	....	....	....	1.03	0.0	11	.....	se.	....	.....	....	5	5	18	....	10.3
St. Paul	837	114	124	29.10	30.07	— .05	18.6	+ 3.2	36	13	26	—22	26	11	30	18	15	86	1.03	+ 0.1	12	4,914	se.	29	se.	13	5	4	19	7.5	10.9
La Crosse	.....	70	78	.....	.....	.....	22.0	+ 3.4	40	20	29	—13	27	15	34	....	....	....	1.39	+ 0.3	8	4,558	w.	30	sw.	17	7	4	17	6.9	12.7
Davenport	599	71	79	29.39	30.07	— .04	28.0	+ 3.4	48	20	34	— 3	27	22	31	26	22	81	1.57	0.0	11	5,768	nw.	32	ne.	21	4	9	15	7.3	9.5
Des Moines	867	84	88	29.12	30.10	— .03	26.7	+ 3.9	48	16	34	—14	26	19	32	24	20	75	0.71	— 0.6	6	5,459	nw.	28	w.	13	7	8	13	6.5	8.1
Dubuque	698	60	60	29.28	30.08	— .02	24.8	+ 2.5	40	13	32	—10	27	18	36	33	30	84	1.43	0.0	9	4,306	w.	28	ne.	21	9	3	16	6.4	10.2
Keokuk	614	64	78	29.34	30.08	— .03	31.1	+ 3.0	55	20	38	— 1	27	25	36	28	24	80	0.96	— 0.8	8	5,358	nw.	27	w.	24	6	11	11	6.2	5.9
Cairo	359	87	93	29.65	30.06	— .06	41.0	+ 1.7	69	20	48	11	27	34	28	36	31	74	3.95	0.0	13	6,016	n.	36	n.	25	5	7	16	7.0	1.7

TABLE I.—*Climatological data for Weather Bureau Stations, February*, 1897—Continued.

Stations.	Elevation of instruments: Barometer above sea level, feet.	Thermometers above ground.	Anemometers above ground.	Pressure, in inches: Mean actual, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Departure from normal.	Temperature of the air, in degrees Fahrenheit: Mean max. and min. + 2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.	Mean wet thermometer.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches: Total.	Departure from normal.	Days with .01, or more.	Wind: Total movement; miles.	Prevailing direction.	Maximum velocity: Miles per hour.	Direction.	Date.	Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Total snowfall.
Up. Miss. Val.—Con																															
Springfield, Ill.	644	82	92	29.36	30.08	— .05	31.8	+ 0.6	64	20	38	4	27	26	30	28	23	74	1.15	— 1.6	10	6,425	nw.	28	s.	13	4	9	15	7.2	5.0
Hannibal	534	75	107	.....	.....	.....	32.6	.....	62	20	39	3	27	26	30	....	....	....	1.54	— 0.9	11	6,116	sw.	36	w.	20	6	7	15	6.9	9.3
St. Louis	567	111	210	29.45	30.09	— .04	36.8	+ 1.7	71	20	43	8	27	30	30	32	28	76	2.67	— 0.1	11	7,121	nw.	31	s.	13	5	8	15	7.0	7.1
Missouri Valley.							26.7	+ 1.1											1.24	— 0.2											
Columbia	.....	4	84	.....	.....	.....	35.4	+ 1.4	68	20	43	4	27	28	34	....	....	....	1.22	— 1.4	8	6,543	nw.	33	ne.	21	3	6	19	7.7	9.3
Kansas City	963	78	95	29.01	30.08	— .06	32.9	+ 0.8	59	20	39	4	26	27	32	30	27	80	1.65	— 0.2	10	5,403	e.	26	n.	26	4	10	14	7.0	15.4
Springfield, Mo.	1,324	100	103	28.58	30.04	— .08	37.8	+ 0.9	72	21	45	10	27	30	33	33	29	78	4.10	+ 0.6	9	7,493	se.	34	se.	3	5	10	13	6.4	4.7
Topeka	.....	81	....	.....	.....	.....	33.1	+ 1.8	58	20	40	3	26	26	36	....	....	....	1.46	— 0.1	7	.....	n.	....	.....	...	4	13	11	....	11.8
Lincoln	1,181	...	....	28.72	30.06	.....	27.0	+ 3.6	61	16	35	— 9	26	19	35	24	22	84	0.90	— 0.3	8	6,328	ne.	38	nw.	13	5	15	8	6.4	8.7
Omaha	1,103	92	97	28.84	30.09	— .08	27.2	+ 3.1	59	16	35	—11	26	20	32	24	22	82	0.63	— 0.2	6	5,241	nw.	24	nw.	16	4	12	12	6.6	6.0
Sioux City	1,165	96	109	.....	.....	.....	21.7	+ 1.2	50	16	32	—15	26	12	46	....	....	....	0.43	— 0.2	5	6,895	nw.	42	nw.	13	4	8	16	7.0	5.1
Pierre	1,460	50	61	28.41	30.08	— .09	14.9	0.0	41	16	24	—15	26	6	39	13	11	88	0.29	— 0.1	5	5,542	nw.	36	w.	17	7	11	10	5.8	2.3
Huron	1,310	63	72	28.59	30.11	— .06	10.4	— 2.7	38	16	21	—25	26	0	37	9	6	82	0.52	0.0	6	8,781	se.	50	se.	19	4	13	11	6.5	5.2
Northern Slope.							22.1	+ 0.5											0.72	+ 0.2											
Havre	2,494	15	33	27.92	30.02	— .14	11.2	— 3.7	43	4	32	—15	19	0	46	11	9	89	0.32	— 0.2	8	5,670	w.	54	sw.	16	5	13	10	6.2	3.2
Miles City	2,372	41	49	27.38	30.04	— .12	15.2	— 1.0	43	15	26	—20	23	5	51	14	11	81	0.65	+ 0.1	6	3,733	nw.	37	w.	16	8	13	7	5.5	6.0
Helena	4,108	88	93	25.68	30.06	— .09	24.8	+ 2.4	44	15	32	4	20	18	25	21	15	66	1.49	+ 0.7	11	4,648	sw.	48	sw.	16	7	8	13	6.1	14.7
Rapid City	3,251	53	61	26.50	30.03	— .14	24.8	+ 2.8	55	19	35	— 5	25	14	38	21	17	81	0.46	— 0.2	7	4,669	w.	36	w.	16	6	10	12	6.0	4.7
Cheyenne	6,105	58	60	23.83	30.13	— .04	25.8	— 1.6	52	28	36	— 5	25	16	32	21	10	57	0.57	+ 0.2	5	7,656	nw.	48	nw.	15	7	13	8	5.8	5.3
Lander	5,372	26	36	24.48	30.08	— .02	23.0	— 1.0	51	28	36	— 4	23	10	38	19	12	66	1.11	+ 0.5	10	2,694	sw.	42	w.	15	7	15	6	5.5	11.1
North Platte	2,826	43	52	27.01	30.08	— .08	29.6	+ 3.5	58	25	40	3	22	19	40	25	21	75	0.46	0.0	4	5,127	nw.	32	nw.	12	4	19	5	6.0	5.2
Middle Slope.							34.6	+ 0.2											1.30	+ 0.5											
Denver	5,280	83	151	24.58	30.09	— .07	31.2	— 1.8	65	25	43	8	22	20	42	25	14	54	0.82	+ 0.3	9	5,027	s.	46	w.	16	8	13	7	5.0	10.8
Pueblo	4,713	74	81	25.14	30.02	— .13	33.8	— 0.3	65	25	45	2	11	22	47	25	17	58	1.47	+ 1.0	6	4,581	w.	42	sw.	20	6	18	4	5.3	11.7
Concordia	1,398	42	47	28.51	30.07	— .10	30.8	+ 1.9	59	16	38	0	26	23	36	25	23	76	0.52	— 0.4	4	4,359	s.	25	nw.	13	9	6	13	6.2	5.2
Dodge City	2,504	44	52	27.33	30.05	— .07	33.5	+ 1.2	65	20	43	4	15	24	35	29	26	82	2.38	+ 1.8	7	6,216	ne.	36	sw.	27	12	10	6	4.6	22.5
Wichita	1,351	78	85	28.56	30.04	— .07	35.9	— 1.5	68	20	44	12	26	27	33	31	26	75	1.31	+ 0.1	4	5,775	n.	29	s.	27	5	13	10	6.2	9.2
Oklahoma	1,218	54	53	28.69	30.03	— .08	42.1	+ 2.0	74	20	51	19	25	33	31	38	34	79	1.32	+ 0.2	6	6,035	n.	28	se.	28	15	6	7	4.6	T.
Southern Slope.							45.6	+ 3.6											0.34	— 1.0											
Abilene	1,749	47	54	28.17	30.04	— .09	51.8	+ 3.7	85	17	65	22	25	39	45	43	35	64	0.02	— 1.4	1	6,631	sw.	34	sw.	28	15	8	5	3.7	T.
Amarillo	3,691	53	61	26.16	30.04	— .08	39.5	+ 3.5	69	19	51	20	11	28	42	33	28	73	0.65	— 0.6	8	10,030	sw.	52	w.	21	11	9	8	4.7	3.0
Southern Plateau.							47.3	— 1.6											0.41	— 0.2											
El Paso	3,767	10	110	26.14	30.02	— .06	49.6	— 0.3	76	28	64	26	23	35	39	36	14	30	0.00	— 0.4	0	9,445	nw.	57	sw.	6	16	11	1	3.1	
Santa Fe	6,998	47	50	23.14	30.07	— .02	30.7	— 2.2	58	28	39	13	25	22	30	26	19	65	1.10	+ 0.3	9	5,084	ne.	40	sw.	19	8	12	8	5.4	10.7
Phœnix	1,076	47	57	28.84	30.00	.....	51.4	— 2.5	78	25	63	30	22	39	37	43	32	54	0.47	— 0.4	3	2,598	e.	22	w.	21	14	10	4	3.7	
Yuma	139	16	50	29.87	30.02	— .03	57.4	— 1.6	83	28	69	37	10	46	35	46	34	45	0.06	— 0.4	1	5,068	nw.	35	nw.	2	15	10	3	3.2	
Middle Plateau.							30.9	— 3.3											3.03	+ 1.8											
Carson City	4,720	47	....	25.21	30.13	.....	30.1	— 5.5	56	25	42	—14	23	18	48	26	21	70	4.30	+ 2.8	13	.....	sw.	....	.....	...	9	10	9	5.3	30.5
Winnemucca	4,340	59	70	25.61	30.10	— .05	31.8	— 1.8	54	25	40	7	22	23	26	28	22	67	1.15	+ 0.2	15	7,671	sw.	50	sw.	5	5	8	15	7.2	5.9
Salt Lake City	4,344	83	90	25.59	30.14	— .06	30.9	— 2.5	47	28	37	12	18	24	23	29	26	79	3.81	+ 2.5	17	3,742	se.	32	s.	12	4	2	22	8.3	17.9
Northern Plateau.							31.1	+ 5.4											2.38	+ 0.6											
Baker City	3,470	49	47	26.35	30.06	— .07	29.6	+ 5.1	47	11	37	5	21	22	26	27	23	77	1.82	+ 0.1	18	3,813	nw.	30	sw.	11	1	9	18	7.9	13.3
Idaho Falls	4,742	10	56	25.14	30.14	— .06	22.2	+ 8.3	38	7	32	— 6	18	13	33	21	18	82	2.58	+ 0.6	16	7,444	s.	48	s.	11	3	3	22	8.3	24.9
Spokane	1,943	99	107	27.87	29.99	— .12	33.2	+ 4.2	49	27	39	12	13	27	35	31	27	79	2.53	+ 0.5	14	3,267	sw.	31	sw.	15	5	5	18	7.4	15.8
Walla Walla	1,018	65	73	28.88	30.00	— .11	39.4	+ 4.2	57	25	46	25	1	33	26	36	33	79	2.61	+ 1.2	16	4,243	s.	36	s.	15	7	11	10	6.1	2.2
N. Pac. Coast Reg.							42.2	+ 1.1											7.72	+ 1.4											
Fort Canby	179	10	34	29.72	29.92	— .10	42.6	+ 1.0	58	26	47	32	13	38	19	42	40	91	10.24	+ 4.0	24	10,082	se.	52	se.	7	3	5	20	8.1	3.5
Port Angeles	29	47	61	.....	.....	.....	40.3	+ 3.6	55	1	46	30	21	34	18	....	....	....	2.19	— 0.8	16	3,633	sw.	30	sw.	15	1	14	13	7.5	0.5
Pysht	.....	5	....	.....	.....	.....	39.9	.....	52	10	45	28	21	35	16	....	....	....	5.94	— 2.2	22	.....	e.	....	.....	...	*1	*2	*24	....	1.0
Seattle	119	100	108	29.81	29.94	.....	42.2	.....	52	26	46	32	13	38	17	40	37	80	2.99	.....	21	3,991	se.	34	sw.	4	3	11	14	7.2	0.2
Tatoosh Island	86	12	21	29.81	29.91	— .11	41.7	+ 1.0	51	26	45	33	*	38	12	39	35	77	11.16	+ 2.7	23	9,971	e.	60	w.	15	2	5	21	8.5	3.0
Astoria	.....	39	60	.....	.....	.....	43.0	0.0	56	26	48	32	*	38	17	....	....	....	12.89	+ 5.2	24	.....	sw.	....	.....	...	3	7	18	....	
Portland, Oreg	153	203	213	29.80	29.97	— .11	42.3	+ 0.9	58	26	47	30	17	37	22	40	36	80	5.57	— 0.6	19	6,020	s.	43	s.	11	3	10	15	7.1	T.
Roseburg	521	56	67	29.42	30.00	— .11	43.5	+ 0.3	63	26	50	28	23	37	29	41	38	82	6.04	+ 1.2	20	2,366	sw.	30	s.	11	4	5	19	7.8	T.
Mid. Pac. C'st Reg.							48.0	— 0.7											0.20	— 2.1											
Eureka	64	60	69	30.00	30.06	— .04	47.2	+ 0.8	58	1	53	31	21	41	21	45	43	87	11.23	+ 5.1	20	3,960	se.	36	nw.	12	5	9	14	6.6	
Redbluff	334	54	58	29.70	30.06	— .04	47.0	— 2.3	72	25	54	31	22	40	25	43	39	76	6.26	+ 2.6	13	3,924	se.	35	se.	5	10	5	13	5.7	3.5
Sacramento	71	106	117	.....	.....	.....	48.8	— 1.5	66	25	55	34	23	43	24	....	....	....	4.15	+ 1.0	13	6,006	se.	35	se.	19	7	10	11	5.5	
San Francisco	153	161	167	29.93	30.09	— .01	50.7	— 1.3	66	25	55	38	20	46	20	47	44	79	4.41	+ 0.7	17	6,340	w.	37	w.	19	7	12	9	5.7	
Point Reyes Light	.....	12	....	.....	.....	.....	49.2	+ 0.7	58	*	53	36	20	45	14	....	....	....	4.93	+ 1.1	18	.....	nw.	....	.....	...	7	8	13	....	T.
S. Pac. Coast Reg.							52.3	— 0.9											3.66	+ 1.5											
Fresno	332	67	70	29.73	30.08	— .02	49.2	— 0.5	73	26	58	31	23	41	31	45	41	76	2.65	+ 1.5	14	3,200	nw.	30	s.	18	12	6	10	5.0	
Los Angeles	330	74	76	29.70	30.06	— .02	53.0	— 1.9	83	26	62	35	*	44	31	48	44	74	5.62	+ 2.4	9	3,497	w.	24	sw.	18	11	11	6	4.2	
San Diego	69	59	70	29.98	30.06	— .03	54.7	— 0.3	76	26	62	38	22	48	28	49	45	72	2.72	+ 0.5	9	3,765	w.	33	sw.	20	14	2	12	4.6	
San Luis Obispo	201	10	46	29.89	30.11	.....	51.6	.....	76	26	62	29	21	41	39	47	43	75	4.40	.....	10	3,155	w.	26	se.	18	10	10	8	4.9	

NOTE.—The data at stations having no departures are not used in computing the district averages. Letters of the alphabet denote number of days missing from the record. * Two or more directions, dates, or years. † Received too late to be considered in departures, etc.

TABLE II.—*Meteorological record of voluntary and other cooperating observers, February, 1897.*

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Alabama.	°	°	°	*Ins.*	*Ins.*
Alco†	82	26	56.5	13.53	
Ashville*†[1]	80	21	47.6	6.09	
Bermuda†	81	27	56.0	9.76	
Birmingham	81	22	53.0	4.03	
Brewton†	82	24	55.2	12.30	
Bridgeport†				3.84	
Citronelle†	77	32	56.4	6.59	
Claiborne Landing†				6.00	
Clanton†	78	25	52.4	7.42	
Cordova†				5.10	
Daphne†	79	27	53.7	9.63	
Decatur†	79	13	47.3	4.13	
Demopolis				6.75	
Elba†	85	31	56.4	8.34	
Eufaula *a*†	81	29	54.3	9.79	
Eufaula *c*†				8.92	
Evergreen†	80	23	52.6	9.82	
Florence *a*†				2.53	
Florence *b*†	77	17	48.4	2.84	
Fort Deposit †				7.04	
Gadsden	77	22	49.2	7.24	
Goodwater†	77	21	49.2	4.33	
Greensboro†	79	26	50.8	5.70	
Hamilton	77	18	48.3	3.73	
Healing Springs†	81	22	52.6	12.05	
Highland Home †	79	29	55.3	6.32	
Livingston	81	27	52.2	5.89	
Lock No. 4	78	23	48.4	5.61	
Madison Station†	77	15	48.0	5.10	
Marion†	79	26	51.8	7.16	
Mount Willing†	82	25	54.5	8.46	
Newbern†	78	27	52.0	5.50	
Newburg	78	15	50.0	2.82	
Newton†	82	25	54.0	10.44	
Opelika†	78	22	51.2	5.92	
Oxanna†	75	30	48.6	5.29	
Pushmataha†	80	27	53.2	6.07	
Rockmills†	80	20	52.9	7.00	
Scottsboro†	78	18	45.8	3.87	
Selma †	80	27	52.2	6.61	
Sturdevant				4.68	
Talladega *[1]	78	24	50.8	5.87	
Tallassee †				7.28	
Thomasville	80	25	53.5	11.70	
Tuscaloosa†	83	24	50.2	4.83	
Union†	79	26	52.4	3.97	
Union Springs†	78	25	52.3	10.01	
Uniontown†	79	29	52.8	5.32	
Valleyhead	76	12	48.2	3.56	
Warrior†				4.76	
Wetumpka	80	24	52.6	5.81	
Wilsonville†				3.99	
Arizona.					
Benson*§	71	30	45.5	0.00	
Bisbee†	68	29	46.2	0.35	T.
Buckeye†	86	27	54.0	0.60	
Buttes				1.02	
Calabasas	74	23	45.2	0.00	
Casa Grande*§	70	32	54.3	0.00	
Congress	73	31	48.4	0.64	T.
Dragoon Summit*§	61	30	49.0	0.54	
Dudleyville	79	25	47.0	0.60	
Eagle Pass*§		18	36.5	0.43	4.0
Farleys Camp†	73	29	43.8	1.50	
Flagstaff	65	−10	31.5		26.0
Fort Apache	66	7	35.8	1.40	4.2
Fort Grant†	74	24	44.6	T.	T.
Fort Huachuca†	70	22	45.4	0.32	
Fort Mohave	78	30	54.6	0.19	
Gilabend *a**§	80	36	54.7	0.70	
Glendale	76	28	49.8	0.55	
Holbrook†	67	10	36.0	0.67	3.5
Ingleside	80	28	48.1	0.50	
Lochiel *[1]	67	24	44.0	0.33	
Maricopa*§	82	28	55.6	0.19	
Mesa†	74	26	50.2	0.75	
Mount Huachuca	70	24	44.6	0.52	
Natural Bridge				1.17	
Oracle†	71	23	45.3	0.96	2.2
Oro				0.17	
Oro Blanco	75	23	46.6	0.38	
Pantano*§	70	29	44.2	1.35	
Parker	83	29	53.6	0.50	
Payson				2.47	12.5
Peoria†	75	30	52.6	0.50	
Phœnix	78	26	49.9	0.48	
Pinal Ranch				2.82	7.0
Reymert †	81	29	52.3	0.78	
St. Helena Ranch				1.29	
San Carlos†	78	24	46.4	0.71	T.
San Simon*§	79	27	45.6		
Showlow				1.06	5.2
Signal†	77	30	50.0	0.38	
Sulphur Spring Valley†				0.12	
Texas Hill*§	80	38	51.9		
Tucson *c*†	80	25	50.7	0.08	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Arizona—Cont'd.	°	°	°	*Ins.*	*Ins.*
Walnut Ranch*†[1]	67	20	43.0	0.24	
Whipple Barracks†	65	− 3	34.6	2.30	11.6
Willcox*§	70	28	45.3	0.00	
Arkansas.					
Amity	79	34	48.6	1.53	1.8
Arkansas City†				4.17	
Beebranch†[4]	73	14	44.6	3.30	1.0
Blackton				5.80	T.
Blanchard Springs†	83	27	51.8	2.12	1.0
Brinkley	78	19	46.8	5.27	
Camden *a*†				2.71	
Camden *b*†	80	23	49.6	2.43	
Canton*[1]	76	10	41.7		2.0
Conway	80	17	47.4	2.47	3.0
Corning†	75	12	41.5	4.38	1.1
Dallas	78	20	47.8	0.88	T.
Dardanelle				1.13	
Elon†	89	25	53.9	3.76	
Fayetteville†	79	13	44.0	1.04	
Forrest	77	19	46.8	4.92	3.0
Fulton†				1.07	
Helena *a*†				6.21	
Hot Springs *a*	80	24	51.1	2.80	3.0
Hot Springs *b*				2.01	
Hot Springs (near)				2.01	
Jonesboro	77	15	44.1	4.82	2.0
Keesees Ferry†	84	9	43.6	0.81	0.2
Lacrosse†[1]	76	8	40.2	1.78	2.0
Lonoke*[1]	78	20	47.8	2.13	2.0
Lutherville*[1]	82	17	46.5		
Malvern†	79	22	49.0	1.61	2.0
Marianna*[1]	75	24	49.6		0.2
Marvell	78	22	48.9	4.93	
Moore				3.13	1.0
Mossville	76	15	42.0	1.60	
Mount Nebo†	76	15	43.6	1.58	
New Gascony*[1]	74°	22°	48.0°	2.93	T.
Newport *a*†				4.33	
Newport *b*†	78	10	42.4	4.39	
Newport *c*†	78	16	45.3	3.71	1.5
Oregon*[1]	76	12	38.0		
Osceola†	78	17	45.6	5.46	
Ozark†	82	18	47.3	0.72	
Picayune†	82	26	51.8	2.02	1.0
Pinebluff†	80	23	49.8	2.90	0.5
Pocahontas†	75	13	40.2	3.28	T.
Prescott†	82	27	53.1	1.16	
Rison	78°	23°	48.4°	1.16	
Russellville	82	18	46.2	1.52	2.1
Silver Springs †	77	7	40.6	1.25	
Stuttgart†	78	19	47.5	3.41	0.4
Texarkana†	82	27	53.2	0.73	T.
Warren †				2.97	2.0
Washington*†[1]	81	29	51.6	1.19	
Wiggs*[1]	82	22	50.4	1.46	
Winslow				0.79	T.
Witts Springs†	62	10	39.8	2.75	1.2
California.					
Adin	56	5	32.4	3.62	21.0
Agnew	79	28	45.3	4.15	
Arlington Heights	76	31	50.2	3.17	
Athlone*§	65	29	46.2	2.32	
Azusa				10.38	4.1
Ballast Point L. H				2.92	
Barstow†	61	28	44.2	0.65	0.5
Bear Valley†				16.05	69.0
Berkeley	64	35	48.7	4.68	
Bishop†	64	12	38.8	1.67	11.0
Bishop Creek*§	62	17	39.4	1.13	6.5
Boca*§	56	−20	21.8		63.5
Bodie†	42	−24	17.6	4.39	39.0
Bowmans Dam †	60	10	32.3	18.31	86.0
Caliente*§	69	36	49.7	4.96	2.5
Calloway Canal†				1.67	
Campbell	67	30	48.8	2.49	
Cape Mendocino L. H				10.94	
Castle Pinckney*[1]	78	39	52.6	5.82	
Cedarville†[1]	53	9	31.6	2.16	23.0
Centerville*[1]	70	39	53.1	4.47	
Chico*§	74	30	50.4	5.94	
Chino*†[6]	71	32	48.9	6.56	2.0
Cisco*§	42	4	25.2		102.0
Claremont†	78	36	47.6	6.35	0.8
Corning*§	69	30	45.6	5.69	
Coronado	83	45	62.0	2.72	
Craftonville	77	24	46.5	5.30	
Crescent City †	62	30	46.8	15.31	T.
Crescent City L. H				15.35	
Daunt				7.45	2.8
Davisville *b*	82	34	55.6	4.33	
Delano*§	66	33	49.2	2.29	
Delta*§	50	28	39.1	7.53	4.0
Descanso*§	66	25	43.2	6.27	2.0
Drytown	71	28	46.5	9.59	
Dunnigan*§	64	32	49.2	4.99	
Durham*[1]	60	29	42.8	5.17	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
East Brother L. H				3.55	
Edgwood*§	62	15	38.0	2.03	4.0
Edmanton*[1]	58	8	30.9	13.80	69.0
Escondido	84	23	49.8		
Fallbrook*[1]	83	34	50.4	6.61	
Famosa†	64	33	46.6	2.38	
Folsom City *b**[1]	70	34	49.0	7.95	
Fordyce Dam †				14.92	97.0
Fort Bragg†				10.31	
Fort Ross				11.49	
Fort Tejon				5.14	18.0
Georgetown†	65	22	41.0	18.26	20.0
Glendora				6.35	
Goshen*§	75	30	51.8	3.05	
Grand Island*§	66	34	49.8	2.77	
Grass Valley				14.75	13.0
Greenville†	61	− 4	34.2	7.58	24.0
Guinda				4.39	
Healdsburg*[1]	66	30	45.0	6.83	
Hollister	74	26	49.3	2.99	
Hueneme				6.51	
Humboldt L. H				9.65	
Hydesville	66	28	46.5	8.48	
Indio*§	78	34	55.0	0.19	
Iowa Hill*[1]	66	23	38.6	15.83	13.0
Jolon				2.50	T.
Keeler*§	73	33	46.8	0.27	T.
Keene*§	67	20	41.7	7.49	12.0
Kennedy Gold Mine	69	27	45.2	13.06	7.5
Kernville				3.60	6.0
King City*§	68	28	51.9	1.20	
Kingsburg*§	70	32	48.1	2.95	
Kono Tayee	62	30	45.4	4.01	
Lagrange*§	71	34	50.6	6.07	
Laporte*†[1]	51	9	30.9	17.92	90.0
Las Fuentes Ranch				5.12	
Lemoore *a**§	70	29	48.5	2.18	
Lick Observatory†	60	21	36.2	7.42	17.0
Lime Kiln	74	34	50.1		
Lime Point L. H				5.42	
Lodi	67	29	48.7	4.29	
Los Alamos†				3.57	
Los Gatos *b*	65	32	47.2	6.50	
Lytton Springs	67	32	48.9	6.68	
McMullin*[1]	72	28	49.0		
Malakoff Mine*[1]	65	30	39.2	16.57	23.0
Mammoth Tank*§	83	40	57.9	T.	
Manzana	61	12	37.8	3.04	10.0
Mare Island L. H				5.44	
Marysville	65	29	47.6	5.80	
Merced*§	69	32	47.9	3.20	
Middletown*†[1]	70	26	44.3	8.38	3.0
Mills College				6.60	
Milton (near)*[1]	68	32	50.6	6.63	T.
Modesto*§	75	35	51.9	2.90	
Mohave*§	66	30	43.8	1.17	
Mokelumne Hill*§		29	42.8	9.76	12.0
Monterey*§	66	32	52.2	3.63	
Morena Dam*§	70	21	40.4	5.11	4.0
Mount Breckenridge				4.67	30.5
Mount Glenwood*[1]	66	35	48.2	5.54	
Mutah Flat†				3.50	36.0
Needles	82	35	59.4	0.02	
Nevada City†	65	19	40.0	13.63	26.5
Newcastle *a*†	66	28	44.4	8.68	
Newhall*§	74	24	44.1	5.13	2.5
Nordhoff †	83	22	47.5	7.16	
North Ontario	75	30	48.6	7.82	
North San Juan*[1]	74	23	42.8	13.70	12.0
Oakland *a*	68	33	48.8	5.99	
Ogilby*§	82	53	65.4	0.00	
Oleta*[1]	66	27	42.9	14.44	5.0
Orangevale†	66	33	48.2	7.37	
Orland*§	68	29	46.8	4.01	
Oroville *b*	70	38	52.4	8.60	T.
Otay Dam*[1]	91	37	55.0	2.71	
Palermo†	67	29	47.4	6.79	
Paso Robles *b*	70	31	48.4	4.18	T.
Peachland*[1]	68	30	47.1	8.63	
Picacho	76	42	59.2	T.	
Piedras Blancas L. H				3.45	
Pigeon Point L. H				2.63	
Pilot Creek				19.12	45.0
Placerville	64	23	40.9	14.61	5.8
Point Ano Nuevo L. H				4.64	
Point Arena L. H				7.91	
Point Bonita L. H				6.85	
Point Conception L. H				3.36	
Point Fermin L. H				5.20	
Point George L. H				5.52	
Point Hueneme L. H				7.23	
Point Loma L. H				1.13	
Point Montara L. H				5.50	
Point Pinos L. H				2.96	
Point Reyes L. H				4.95	
Point Sur L. H				3.49	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
Pomona (near)	82	28	51.0	6.16	1.0
Poway *3	80	29	46.7	4.91	
Quincy †	56	0	35.1	8.31	22.0
Ravenna *8	69	21	48.7	4.75	5.5
Redding *b* †	74	28	46.0	6.80	3.0
Reedley (near) *1	74	33	49.2	1.93	
Represa	68	30	48.2	8.99	
Riovista	66	32	48.4	3.99	
Roe Island L. H	.....	.....	.....	3.30	
Roseville (near) *5	64	28	42.4	5.20	
Rosewood	72	32	43.4	4.64	2.0
Sacramento *a*	68	30	49.3	4.98	
Salinas *8	62	35	43.9	3.07	
Salton *8	80	35	53.8	0.00	
San Bernardino †	78	27	49.7	5.40	
San Jacinto	77	26	48.0	3.74	
San Jose *b*	73	24	47.8	3.43	
San Leandro *1	71	37	53.4	5.79	
San Louis L. H †	.....	.....	.....	4.67	
San Mateo *6	65	36	52.2	5.76	
San Miguel *8	69	27	50.3	3.62	
Santa Ana *5	80	38	59.0	4.71	
Santa Barbara L. H	.....	.....	.....	2.54	
Santa Clara *a*	.....	.....	.....	3.94	
Santa Cruz *b* †	75	30	50.4	4.96	
Santa Cruz L. H	.....	.....	.....	5.53	
Santa Monica *8	76	45	59.9	5.74	
Santa Paula *b* †	75	28	49.4	4.98	
Santa Rosa *3	67	31	49.5	6.25	
Saticoy	.....	.....	.....	4.77	
Shasta	.....	.....	.....	9.39	6.8
Sierra Madre	76	33	51.1	8.60	
Sneddens Ranch †	.....	.....	.....	2.92	22.0
S. E. Farallone L. H	.....	.....	.....	3.34	
Stanford University	66	30	48.6	3.58	
Stockton *a*	66	32	48.4	2.85	
Summerdale †	54	12	31.8	17.66	41.0
Susanville †	52	4	32.6	4.25	21.5
Sutter Creek	64	23	39.4	8.58	
Tecarte Dam *4	80	21	41.8	4.70	
Tehama *3	68	35	49.7	5.97	
Templeton *8	70	28	47.2	4.71	
Truckee *3	50	—16	25.5	7.97	68.0
Tulare *b*	.....	.....	.....	2.21	
Tulare *c*	82	36	53.2	1.61	
Turlock *b* †	71	28	47.4	2.07	
Ukiah †	69	36	45.1	10.35	2.0
Upper Lake	79	22	45.0	6.35	3.0
Upper Mattole *1	74	34	49.5	17.86	
Vacaville *a* *1	66	33	48.7	4.96	
Ventura †	77	38	49.2	4.83	
Volcano Springs *8	97	38	63.1	0.00	
Walnutcreek	68	32	49.6	3.93	
West Palmdale	.....	.....	.....	3.71	19.0
Westpoint †	.....	.....	.....	14.15	25.0
Wheatland †	65	30	47.2	5.00	
Williams *3	65	34	49.4	2.74	
Wilmington *5	78	37	57.3	.....	
Wire Bridge *5	71	28	47.4	9.96	
Yerba Buena L. H	.....	.....	.....	4.40	
Yreka †	63	18	38.1	3.89	.....
Yuba City *5	61	39	51.3	4.13	
Colorado.					
Alma † *d*	40	—18	13.2	1.30	.....
Antlers †	46	— 5	26.6	1.23	21.4
Arkins	.....	.....	.....	0.50	6.5
Boxelder	.....	.....	.....	0.65	11.0
Breckenridge †	51	—30	12.2	1.99	30.2
Canyon †	68	12	35.4	0.97	7.0
Castlerock †	62	— 3	25.8	1.30	11.0
Collbran	.....	.....	.....	2.14	21.5
Colorado Springs †	58	0	28.8	1.02	15.4
Cope †	62	4	31.6	0.34	3.5
Cripple Creek †	44	— 6	18.8	.....	.....
Delta	67	1	29.4	2.19	.....
Downing †	67	7	35.0	0.30	3.0
Dumont †	52	— 8	24.3	0.55	5.5
Durango	50	— 3	26.5	3.70	40.0
Fleming	.....	.....	.....	1.01	9.5
Fort Collins †	60	— 5	27.6	0.54	6.2
Fort Morgan	59	2	28.1	0.10	1.5
Fox	.....	.....	.....	0.35	3.5
Garnett	.....	.....	.....	0.23	2.2
Gleneyrie †	57	5	28.6	1.59	21.0
Grand Junction †	54	9	32.0	0.80	12.5
Greeley †	59	— 2	27.9	0.61	.....
Gulch †	47	— 6	23.6	2.21	29.0
Gunnison †	48	—28	14.0	1.00	10.0
Holly	.....	.....	.....	1.02	10.2
Holyoke *b*	.....	.....	.....	0.80	8.0
Husted †	61	— 6	29.9	0.96	16.2
La Jara	40	—22	13.8	.....	.....
Lake Moraine †	43	—14	17.3	3.40	34.0
Lamar †	69	14	35.2	0.34	5.0
Laporte	.....	.....	.....	0.50	4.0
Las Animas †	63	12	35.4	0.46	.....
Lay †	47	—22	19.6	2.85	28.5
Leadville (near) *† 1	40	— 7	16.6	1.54	17.2
Leroy †	60	5	30.8	0.72	6.7
Longmont †	65	2	30.8	0.80	8.0
Longs Peak	48	—10	18.6	1.25	19.2
Loveland	.....	.....	.....	0.57	5.5
Meeker †	50	—22	22.1	2.33	25.2
Millbrook †	59	—12	24.5	1.50	15.0
Minneapolis †	66	2	33.3	2.10	21.0
Montrose †	51	— 3	29.1	2.14	18.2
Moraine †	44	— 5	21.7	1.68	20.5
Pagoda †	47	—26	22.4	4.35	43.5
Paonia †	.....	.....	.....	1.20	12.0
Parachute †	48	—13	25.1	1.82	18.2
Pinkhamton *1	52	— 7	21.8	1.35	13.5
Rangely †	46	—17	19.5	0.75	7.5
Redcliff	.....	.....	.....	3.37	33.7
Rico †	46	—17	19.8	5.60	56.0
Rockyford †	67	0	35.0	0.37	2.0
Ruby	.....	.....	.....	23.28	239.0
Saguache †	40	—10	18.0	0.35	3.5
St. Cloud	.....	.....	.....	0.85	8.5
San Luis †	52	—14	17.9	0.92	9.5
Santa Clara *1	55	— 1	27.8	3.75	37.5
Seibert †	.....	.....	.....	0.20	4.0
Sherwood Ranch	43	— 8	17.8	.....	12.5
Smoky Hill Mine †	55	— 1	23.1	2.10	21.0
Stamford *1	46	—12	18.1	5.75	57.5
Steamboat Springs †	50	—32	19.0	3.80	38.0
Sulphur Springs †	53	—34	21.6	2.02	32.0
Surface Creek †	54	— 4	28.5	1.70	19.2
Thon †	61	0	29.9	0.40	7.0
T. S. Ranch †	44	4	25.8	1.45	20.0
Twin Lakes	.....	.....	.....	3.40	34.0
Vilas	.....	.....	.....	2.00	20.0
Walden	39	—19	16.6	0.34	3.5
Wallet †	.....	.....	.....	0.40	4.0
Wray †	67	7	33.2	0.26	2.5
Yuma	.....	.....	.....	0.40	4.0
Connecticut.					
Bridgeport	51	4	29.9	3.00	11.0
Canton †	50	— 5	25.7	3.66	10.5
Hartford *b*	.....	.....	.....	2.83	10.0
Middletown	53	— 7	29.0	3.28	13.0
New London †	44	6	29.4	1.45	5.0
Norwalk	49	— 4	28.0	2.45	10.5
Southington *1	48	— 8	27.1	2.65	12.0
Storrs	46	4	25.4	3.40	11.8
Voluntown †	49	— 6	28.5	2.46	7.8
Waterbury	48	0	29.2	3.48	12.5
West Cornwall †	42	4	25.9	2.21	12.5
Windsor	48	— 7	26.8	2.95	13.1
Delaware.					
Milford	58	11	37.2	5.56	0.8
Millsboro	59	13	37.0	5.82	4.0
Newark	51	10	33.2	4.30	3.5
Seaford †	57	14	36.6	4.79	.....
District of Columbia.					
Distributing Reservoir *5	55	18	37.0	5.84	.....
Receiving Reservoir *5	53	17	36.3	5.89	.....
West Washington	64	11	35.9	5.88	3.7
Florida.					
Amelia †	82	35	56.7	7.82	
Archer †	90	33	61.5	8.78	
Bartow	88	37	66.4	3.31	
Brooksville †	84	37	63.6	4.57	
Clermont †	88	39	65.8	5.44	
De Funiak Springs	82	27	57.2	12.25	
Earnestville †	88	36	65.8	6.92	
Emerson †	84	28	59.8	9.10	
Eustis †	88	36	64.9	7.30	
Federal Point †	86	36	62.0	5.55	
Fort Meade †	85	33	63.9	2.59	
Frostproof †	89	39	67.8	3.52	
Grasmere †	87	37	64.5	4.56	
Haywood	.....	.....	.....	7.83	
Huntington	85	36	63.0	4.17	
Kissimmee	.....	36	.....	6.82	
Lake Butler †	83	31	60.2	9.77	
Lake City †	83	33	60.8	12.79	
Lemon City †	88	45	70.2	1.90	
Macclenny †	85	33	59.9	11.06	
Manatee †	85	34	64.0	2.97	
Merritts Island †	86	44	66.2	2.34	
Milton *1	80	30	57.0	13.23	
Mullet Key †	78	45	64.0	3.89	
Myers †	84	41	68.7	3.48	
New Smyrna †	87	36	63.0	4.24	
Oakhill *1	83	42	64.8	.....	
Ocala *† 1	86	36	62.6	5.12	
Orange City	86	37	64.6	4.57	
Orange Park	84	36	63.6	.....	
Orlando †	86	38	63.3	3.99	
Oxford *† 1	87	40	63.6	3.60	
Plant City †	88	38	64.8	5.40	
Quincy	81 *d*	34 *d*	58.0 *d*	12.40	
Florida—Cont'd.					
St. Francis †	87	31	64.4	6.06	
St. Francis Barracks	85	37	59.8	6.16	
Tallahassee †	78	30	57.2	10.45	
Tarpon Springs †	86	36	64.6	2.13	
Georgia.					
Adairsville †	77	20	45.6	5.10	
Albany †	.....	.....	.....	5.31	
Allentown †	79	22	54.0	8.31	
Americus †	82	25	54.4	8.02	
Athens *b*	75	30	47.8	.....	
Blakely *† 6	81	28	56.9	9.46	
Brag †	82	32	55.2	8.63	
Canton †	.....	.....	.....	5.49	
Cedartown	75	30	47.4	5.77	
Clayton †	71	18	44.8	9.46	T.
Columbus	77	25	49.5	7.84	
Covington	64	21	45.0	6.27	
Dahlonega †	71	16	45.5	6.01	T.
Dublin	.....	.....	.....	9.06	
Elberton †	75	22	47.9	6.43	
Fleming †	77	26	54.6	9.90	
Fort Gaines	82	26	53.8	8.90	
Gainesville	74	21	44.3	4.89	
Gillsville †	75	14	49.6	5.40	
Hawkinsville	.....	.....	.....	8.71	
Hephzibah *† 6	76	32	54.4	9.65	
Jesup	83	27	58.5	12.43	
Lagrange †	77	24	52.0	5.82	
Leverett	76	20	47.7	8.18	
Louisville †	78	32	51.8	9.11	
Lumpkin	79	27	53.2	10.18	
Macon † *b*	.....	.....	.....	8.33	
Marietta	72	20	47.3	4.29	
Marshallville †	77	26	52.4	8.85	
Milledgeville †	77	28	52.4	7.84	
Millen	78	25	51.8	8.94	
Monticello *† 1	73	30	51.3	5.35	
Morgan †	83	24	54.4	8.93	
Newnan †	76	23	48.2	6.70	
Piscola	81	29	58.1	10.40	
Point Peter	.....	.....	.....	6.50	
Poulan †	82	24	55.4	9.12	
Quitman †	82	26	57.9	10.73	
Ramsey	76	16	49.0	5.34	1.0
Resaca †	.....	.....	.....	5.90	
Reynolds	.....	.....	.....	8.67	
Rome †	77	22	47.2	5.78	
Sparta	77	23	51.8	7.31	
Talbotton †	77	23	51.9	7.38	
Tallapoosa	74	19	49.0	6.35	T.
Thomasville †	81	28	57.2	14.17	
Toccoa †	73	21	45.8	6.77	
Washington †	.....	.....	.....	8.72	
Whitesburg	.....	.....	.....	6.63	
Idaho.					
American Falls	46	12	29.6	1.85	.....
Blackfoot †	49	— 1	25.8	1.08	T.
Boise Barracks †	56	16	35.0	2.95	5.2
Burnside †	47	— 4	22.4	1.05	.....
Chesterfield †	48	—22	20.6	1.69	16.0
Cœur d'Alene	50	11	31.6	.....	.....
Corral *† 1	41	—12	20.6	3.30	33.0
Fort Sherman †	48	9	31.4	2.37	14.3
Gimlet †	45	— 6	22.2	2.55	22.5
Grangeville	48	13	30.6	1.98	14.4
Idaho City	48	1	32.2	4.94	35.9
Kootenai †	48	11	30.8	0.70	8.0
Lake †	32	—20	10.0	2.00	20.0
Lewiston *a* †	67	24	39.8	2.38	T.
Lost River †	.....	.....	.....	0.53	6.7
Martin †	45	—15	19.2	2.40	24.0
Marysville	46	—15	21.3	3.75	37.5
Minidoka †	45	6	24.2	1.10	11.0
Moscow †	56 *e*	10 *g*	33.1 *e*	2.33	.....
Murray †	49	1	30.6	4.22	45.4
Oakley	57	10	30.9	0.20	2.0
Ola †	49	— 3	27.4	3.80	16.0
Payette †	51	20	36.6	1.96	4.5
Pollock †	59	22	38.2	1.56	3.0
Rexburg †	39	—19	21.2	1.55	15.5
Roseberry †	52	—14	21.8	2.08	21.5
Salubria †	50	— 2	28.2	3.41	22.2
Shoup	50	0	27.5	2.21	16.3
Soldier †	46	—18	25.0	2.70	27.0
Swan Valley †	45	—14	23.1	2.58	30.5
Warren †	49	—16	23.8	2.48	.....
Yellowjacket †	.....	.....	.....	1.88	.....
Illinois.					
Albion †	69	5	36.3	4.08	.....
Alexander †	65	— 1	32.4	0.83	8.0
Ashton *† 1	42	— 7	26.6	1.51	8.2
Atlanta *5	60	— 6	30.0	1.37	9.0
Atwood *a* *† 2	56	— 4	28.4	2.79	4.5
Aurora *a*	44	— 4	28.9	1.73	4.1
Beardstown †	.....	.....	.....	1.25	4.0
Bloomington †	55	— 5	30.0	1.77	6.5

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Illinois—Cont'd.	°	°	°	*Ins.*	*Ins.*
Bushnell †	55	— 2	30.0	0.69	5.5
Cambridge	48	— 4	28.6	1.52	8.8
Carlinville †	70	4	34.2	1.62	5.8
Carrollton	59	3	32.7	1.21	6.2
Catlin	60	5	32.0	1.00	3.0
Charleston	58	2	31.9	2.28	3.9
Chemung *[1]	39	— 7	24.6	1.77	14.5
Chester	.....	.....	.....	2.81	.....
Clane *†	69	6	34.3	3.70	3.5
Clearcreek †	48	— 7	29.0	1.65	6.5
Clinton	.....	.....	.....	2.75	.....
Coatsburg †	62	— 3	31.3	0.87	7.7
Cobden †	70	3	38.2	4.47	4.4
Cordova	.....	.....	.....	1.52	.....
Decatur †	66	0	31.9	1.23	5.3
Dixon †	44	— 4	27.2	1.25	10.8
Duquoin *[1]	72	7	36.8	2.58	4.8
Dwight †	48	— 6	28.2	1.46	7.6
East Peoria †	56	— 5	30.4	1.25	5.5
Effingham †	66	5	34.6	2.73	2.8
Evanston *[10]	42	— 6	28.3	.....	.....
Fort Sheridan †	44	— 4	27.9	1.07	4.7
Friendgrove *†[4]	.....	10	35.0	4.62	3.0
Galva †	49	— 6	27.8	1.23	5.4
Glenwood *†[1]	48	1	29.4	1.57	4.0
Golconda †	69	16	40.3	5.13	.....
Grafton †	.....	.....	.....	2.01	12.0
Greenville †	67	2	33.3	3.25	9.6
Griggsville †	64	1	33.1	1.39	.....
Halliday *[5]	65[d]	9[d]	38.3[d]	2.94	4.0
Havana †	57	1	32.7	1.32	10.0
Herrin *[1]	64	6	39.8	2.86	7.4
Hillsboro †	70	3	34.0	2.02	3.0
Iron †	69	9	37.7	2.93	1.5
Joliet †	50	— 3	31.2	1.84	7.8
Jordans Grove †	68	9	37.4	2.37	3.9
Kankakee *a* †	53	— 3	28.8	1.07	.....
Kishwaukee	43	— 6	26.2	1.38	11.0
Knoxville *a* *[5]	48	— 8	29.5	0.98	5.2
Lagrange †	44	— 3	28.6	1.83	8.5
Laharpe *[1]	52	— 6	29.8	1.83	8.8
Lanark *†[1]	41	— 8	25.0	0.89	6.0
Lexington	54	— 4	31.7	2.51	4.0
Loami †	.....	.....	.....	0.90	1.0
Louisville †	69	5	35.2	2.29	4.0
McLeansboro †	73	8	37.2	4.00	1.8
Martinsville †	61	5	33.2	2.50	4.0
Martinton †	52	— 1	29.7	1.37	10.5
Mascoutah *[5]	70	10	36.0	3.59	8.2
Mattoon *[1]	60	8	34.8	1.88	1.8
Minonk †	51[r]	— 4	29.4	1.45	6.8
Monmouth †	51	— 5	29.2	0.82	4.7
Morrisonville †	68	2	33.4	1.20	3.6
Mount Carmel †	.....	.....	.....	4.10	5.0
Mount Pulaski	64	0	32.3	1.50	8.2
Mount Vernon	71	7	35.7	3.39	4.5
New Burnside †	69	5	38.9	3.35	1.5
Olney *a* *[1]	67	4	35.9	2.92	8.1
Oregon †	41	— 8	25.2	0.77	.....
Oswego *[1]	42	— 5	26.9	1.60	7.0
Ottawa †	48	— 5	27.8	1.71	6.0
Palestine †	63	5	35.3	2.95	6.5
Peoria *a* †	.....	.....	.....	1.51	5.0
Peoria *b* †	54	— 2	31.8	1.19	5.2
Philo †	63	0	30.9	1.56	5.0
Plumhill †	68	9	35.8	2.54	3.5
Rantoul †	58	— 2	30.1	1.18	6.8
Reynolds	48	— 6	27.5	1.42	7.0
Riley †	38	— 7	25.3	1.49	9.0
Robinson *†[3]	61	5	32.6	2.72	6.1
Rockford †	42	— 5	27.3	1.47	9.5
Rose Hill *†[1]	58	5	35.8	4.52	5.8
Roundgrove †	44	— 5	27.6	1.73	6.4
St. Charles *†[1]	42	— 4	28.5	1.99	11.5
St. John *†[1]	61	7	35.4	2.46	T.
Scales Mound	42	—12	25.1	0.95	9.5
Streator †	48	— 4	28.5	1.55	7.0
Sycamore †	40	— 5	26.4	1.31	6.0
Tiskilwa *†[3]	41	— 5	25.2	1.27	6.5
Tuscola †[5]	65	0*	30.0	1.40	4.9
Walnut †	45	— 5	28.8	1.45	5.2
Wheaton *[3]	.....	0	25.8	2.27	17.0
Winnebago †	41	— 7	26.0	1.38	10.0
Zion †	45	—11	26.2	1.17	9.2
Indiana.					
Anderson †	56	2	32.0	1.86	8.0
Angola *[1]	52	— 5	29.5	1.90	10.3
Auburn †	49	— 1	29.8	1.18	.....
Bloomington †	61	6	34.6	3.35	6.0
Bluffton †	52	— 1	30.0	2.05	13.5
Bright †	60	7	34.7	4.10	5.5
Butlerville †	62	5	34.4	4.00	6.7
Cambridge City †	58	2	32.8	2.43	6.1
Columbia City *[1]	42	1	29.1	1.42	7.6
Columbus †	63	4	34.2	3.21	5.0
Connersville †	58	4	32.7	2.57	6.0

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Indiana—Cont'd.	°	°	°	*Ins.*	*Ins.*
Delphi †	54	0	29.4	1.50	8.0
Edwardsville *†[1]	65	10	37.8	4.83	0.5
Evansville †	67	9	36.9	4.66	T.
Farmland †	56	4	32.4	2.33	12.5
Fort Wayne	50	0	30.1	.....	.....
Franklin *[1]	60	6	33.8	2.35	9.0
Greencastle †	56	2	32.0	2.95	5.5
Greensburg	62	6	35.2	4.01	4.7
Hammond †	46	— 4	29.2	3.42	11.0
Huntington	50	1	29.1	3.00	17.0
Jasper †	65	10	38.0	4.95	.....
Jeffersonville	65	10	38.2	4.42	T.
Knightstown †	59	4	32.9	2.93	8.0
Kokomo †	54	2	31.4	2.02	11.8
Laconia	67	10	36.7	4.25	T.
Lafayette †	55	— 2	31.0	1.62	9.8
Logansport *b* †	53	1	29.7	1.26	7.0
Madison †	64	11	37.5	6.15	1.0
Marengo †	65	10	37.3	5.20	4.1
Marion †	54	— 1	30.9	1.52	8.2
Mauzy †	56	4	32.0	2.37	5.0
Mount Vernon †	71	9	38.4	3.80	T.
Northfield †	55	1	30.3	2.81	10.0
Richmond	58	1	33.1	2.52	9.0
Rockville †	58	1	32.7	2.04	7.0
Salem	65	6	34.6	6.05	5.5
Scottsburg	64	9	37.4	6.05	2.5
Seymour †	60	8	33.6	5.30	9.0
Shelbyville	58	6	34.0	2.56	7.1
South Bend †	44	— 5	28.8	1.79	12.5
Sunman	64	6	32.6	3.43	8.0
Syracuse †	.....	.....	.....	1.57	10.5
Terre Haute †	61	5	34.3	2.56	4.5
Tipton †	54	— 1	30.8	2.03	8.5
Topeka †	42[r]	— 2	28.6[r]	1.76	5.8
Valparaiso †	48	— 3	28.7	1.92	8.0
Vevay	64	8	37.4	6.25	.....
Vincennes †	65	6	37.7	2.57	.....
Warsaw †	49	— 1	29.9	1.16	.....
Washington †	67	8	37.8	.....	.....
Worthington †	62	5	35.4	2.46	6.6
Indian Territory.					
Eufaula	.....	.....	.....	0.61	2.5
Healdton †	82	15	47.5	0.34	
Lehigh †	83	17	46.0	0.42	
Purcell	.....	.....	.....	0.90	
South McAlester	79	19	43.4	.....	
Tahlequah	79	14	45.5	1.25	
Tulsa †	.....	.....	.....	2.40	.....
Wagoner	77	15	43.6	0.90	
Iowa.					
Adair	.....	.....	.....	0.45	4.5
Afton	46	—12	26.8	1.70	10.0
Algona *[1]	39	—24	21.9	0.87	8.5
Alta *a* †	42	—20	18.8	0.55	4.6
Amana †	43	—10	25.2	0.79	5.2
Ames *b*	49	—17	24.6	0.22	4.0
Atlantic †	57	—14	25.6	0.63	6.2
Audubon	52	—19	23.4	0.75	7.5
Belknap	51	— 8	27.6	1.67	14.0
Belleplaine	46	—16	26.8	1.35	11.0
Bonaparte †	40	— 5	29.4	0.97	4.0
Britt	38	—22	21.5	0.63	6.2
Carroll	52	—21	22.9	0.96	7.0
Cedarfalls	40	—16	23.9	0.70	7.0
Cedar Rapids †	43	—11	24.5	0.71	9.3
Charlton	46	— 9	28.6	1.80	9.0
Charles City †	40	—20	21.5	1.00	8.5
Clarinda †	52	— 9	28.3	0.56	4.2
Clinton	45	— 6	28.1	1.61	11.0
College Springs	47	— 9	28.6	0.44	.....
Corning †	53	—13	26.7	0.60	5.0
Council Bluffs	61	—10	27.8	0.28	4.0
Cresco †	37	—18	20.0	0.76	6.7
Decorah †	38	—18	21.1	0.91	9.5
Delaware *[2]	40	—13	21.8	0.92	7.5
Denison †	50	—19	25.4	0.90	9.0
Dows	40	—20	22.6	1.00	10.0
Elkader †	42	—17	23.0	0.97	8.0
Estherville	44	—22	20.1	0.55	5.5
Fairfield †	46	— 5	27.4	1.20	8.5
Fayette †	39	—16	22.8	1.22	10.6
Fonda	57	—18	24.9	0.85	8.5
Forest City	35	—22	19.7	0.60	6.5
Fort Madison *†[1]	51	5	32.6	1.70	8.0
Galva †	46	—20	22.8	0.40	4.0
Gardengrove	46	—13	26.0	0.93	10.0
Gladbrook	.....	.....	.....	0.41	.....
Glenwood †	51	—13	25.9	0.30	3.0
Grand Meadow *[1]	36	—10	22.0	0.93	8.5
Greene	39	—18	22.4	0.39	4.0
Greenfield †	51	—15	25.8	0.48	5.2
Grinnell †	41	—14	24.8	1.00	7.0
Grundy Center	40	—19	22.8	0.91	8.0
Hampton	39	—20	21.8	0.80	14.1
Hawkeye	.....	.....	.....	1.90	12.0

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Iowa—Cont'd.	°	°	°	*Ins.*	*Ins.*
Hopeville †	46	—12	26.4	0.84	.....
Humboldt †	46	—21	22.8	1.03	10.0
Independence †	39	—19	21.6	0.75	7.5
Indianola †	49	—15	26.8	0.81	10.4
Iowa City *a* †	46	— 9	26.1	1.30	12.0
Iowa Falls †	40	—23	22.6	1.15	11.0
Keosauqua	55	— 2	29.8	1.55	11.0
Knoxville	46	—12	27.6	1.72	12.0
Lansing	42	—16	25.2	0.94	9.0
Larchwood	.....	.....	.....	0.38	3.8
Larrabee †	45	—22	20.7	0.55	4.5
Lemars	43	—18	22.0	0.60	6.0
Lenox *[1]	47	— 8	27.8	0.70	7.0
Logan †	55	—14	25.8	0.65	6.0
Malvern *[1]	60	—12	26.6	0.53	5.6
Maquoketa	42	— 7	27.0	1.15	9.0
Marshall †	44	—16	25.2	0.61	3.0
Millman	.....	.....	.....	0.95	9.5
Monticello *†[1]	40	—10	24.7	1.07	8.5
Mooar	55	— 9	28.4	0.80	.....
Mountayr †	45	—10	27.8	1.23	11.0
Mount Pleasant *[1]	46	— 2	29.7	1.37	.....
Mount Vernon *a* *[1]	42	—10	24.8	0.36	.....
Mount Vernon *b*	43	—10	25.4	1.53	12.1
Neola	56	—13	24.1	0.40	4.0
Newton †	43	—15	25.4	1.01	12.7
Northwood	42	—21	21.0	0.80	8.0
Odebolt	.....	.....	.....	0.72	7.5
Ogden	52	—18	25.0	0.54	9.1
Osage *†[3]	.....	—20	19.0	1.81	17.5
Osceola	48	—13	27.5	1.52	10.0
Oskaloosa †	48	—11	27.8	1.02	9.9
Ottumwa	52	— 9	28.3	1.60	14.8
Ovid †	49	—10	27.2	1.71	14.5
Plover	43	—21	22.0	0.90	9.0
Primghar	39	—21	20.4	0.35	3.5
Red Oak	58	0	30.0	0.56	7.6
Reinbeck	.....	.....	.....	1.18	.....
Rock Rapids	42	—20	18.6	0.50	5.0
Sac City †	47	—18	22.4	0.95	9.5
St. Charles	47	—13	27.1	1.49	8.3
Seymour †	50	—10	29.2	1.55	6.8
Sibley	39	—23	18.1	0.68	6.8
Sidney	56	— 9	27.2	0.80	7.8
Sigourney	46	—11	25.7	1.09	9.5
Spencer	42	—20	19.8	0.34	4.8
Spirit Lake †	40	—24	16.9	0.34	3.4
Stuart	48	—15	25.5	0.66	6.6
Toledo	40	—15	24.6	0.60	6.0
Villisca †	54	—10	27.2	0.38	4.5
Vinton *[1]	38	—12	24.8	0.90	8.0
Washington	49	— 8	26.9	0.82	.....
Waterloo	41	—14	23.3	0.87	8.4
Waukee	42	—16	23.1	0.40	4.0
Waverly	38	—17	22.9	0.90	9.0
Webster City	44	—17	24.4	0.42	5.4
Westbend *†[1]	40	—20	21.0	1.26	12.0
Wilton Junction †	46	— 7	28.0	1.45	12.0
Winterset †	48	—15	25.5	1.10	11.0
Kansas.					
Abilene †	53	6	31.2	1.70	17.0
Achilles *[3]	66[r]	— 1	24.8	0.92	9.2
Altoona *†[3]	69	16	34.0	0.90	7.0
Anthony	.....	.....	.....	0.97	5.8
Assaria *[5]	52	4	29.7	1.60	14.5
Atchison †	59	0	30.7	0.79	11.3
Augusta	70	13	35.2	1.30	3.8
Beloit †	56	4	31.8	0.61	6.3
Burlington	73	12	36.0	1.25	6.0
Campbell	50	— 3	29.4	0.93	10.0
Colby †	64	2	32.4	0.65	7.0
Columbus †	72	10	37.4	3.45	3.0
Coolidge †	67	7	35.0	1.00	10.0
Cunningham †	65	10	35.0	0.45	3.5
Delphos *[1]	50	1	30.6	1.08	10.8
Downs	.....	.....	.....	0.92	5.0
Dresden	.....	.....	.....	0.52	4.8
Effingham *	55	0	31.0	.....	.....
Elgin *[1]	72	15	36.0	1.52	3.6
Ellinwood †	61	6	31.9	3.12	21.0
Emporia *†[1]	59	8	34.8	1.70	12.0
Englewood †	73	9	36.2	0.70	6.5
Eureka †	.....	.....	.....	1.14	3.0
Eureka Ranch †	60	8	31.7	0.49	3.0
Fall River	70	12	37.3	1.24	5.2
Fort Riley †	57	12	32.8	1.35	12.0
Fort Scott †	68	11	35.0	2.41	10.0
Frankfort	60	0	33.2	1.22	12.2
Garden City	61	— 8	33.7	2.33	13.0
Garfield	.....	.....	.....	0.98	12.6
Gibson *[5]	58	10	30.6	0.60	5.0
Goodland	62	7	32.7	0.50	5.0
Gove *†[1]	61	8	32.2	1.00	10.0
Grainfield *[6]	72	12	35.3	0.50	5.0
Grenola *[1]	68	11	35.2	0.90	4.0
Halstead	58	8	32.2	0.84	7.0

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Kansas—Cont'd.	°	°	°	*Ins.*	*Ins.*
Horton	52	— 1	31.0	0.80	11.0
Hutchinson†				1.20	12.0
Independence†	72	14	37.2	1.31	3.5
Lakin†				1.20	12.0
Lawrence	58	4	32.9	1.54	14.0
Lebo†	58	8	33.4	1.73	6.0
Macksville	65	6	33.4	0.93	14.0
McPherson†	50	9	30.8	1.40	14.0
Manhattan *b*	60	4	31.5	1.20	11.9
Manhattan *c*	61	5	31.6	1.41	15.5
Marion†	60	8	34.5	0.80	8.0
Meade†	69	7	38.8	1.18	16.0
Medicine Lodge†	67	13	35.8	0.63	3.2
Minneapolis†	55	5	31.1	1.15	11.2
Morantown†	65	11	33.9	1.80	3.4
Morton†	64	6	35.0	1.55	15.5
Norton	64	— 6	31.0	0.60	6.0
Norwich†	68	12	36.2	1.17	10.0
Oberlin†				1.10	9.0
Olathe†	65	5	34.0	2.73	13.0
Osage City†	58	5	33.4	1.90	11.0
Oswego	75	14	39.1	2.15	2.0
Ottawa	59	5	34.2	1.43	4.8
Paola†	60	15	34.6	1.95	9.0
Powhattan	52	— 3	30.0	0.79	10.5
Pratt	65	10	34.4	0.85	2.5
Rome*†	68	15	37.9	1.50	3.0
Russell†	56	4	32.4	1.55	10.8
Salina†	56	6	31.4	1.66	13.2
Sedan†	72	12	36.8	1.07	4.5
Seneca	53	— 2	30.2	0.87	8.2
Sharon Springs*‡	70	7	34.2	0.70	7.0
Ulysses†	56	— 5	30.1	1.80	18.0
Wallace*‡	64	8	33.8	0.15	2.8
Wamego*‡	56	2	30.4	1.80	17.0
Wellington*‡	67	18	38.8	1.45	4.0
White Rock				T.	
Winona*‡	68	7	35.8	0.50	5.0
Yates Center	67	7	34.8	1.06	3.0
Kentucky.					
Alpha†	71	15	44.6	6.20	2.0
Ashland*‡	70	14	38.7		T.
Bardstown†	65	12	37.4	6.54	0.5
Blandville†	70	8	39.3	4.38	1.2
Bowling Green *a*‡	74	11	39.6	5.26	2.1
Bowling Green *b*†	75	12	41.6	4.56	1.4
Burnside†				7.12	1.0
Caddo†	57	0	36.0	4.85	2.0
Canton*†‡	72	14	42.3	3.72	2.0
Carlisle	65[1]	10[1]	37.6[1]	6.24	1.0
Carrollton†	62	12	38.0	6.75	T.
Catlettsburg*†‡	61	17	39.0	8.20	3.0
Earlington	70	16	41.8	5.67	2.0
Edmonton†	70	12	41.5	7.64	1.5
Eubank*†‡	72	12	41.0	7.59	1.5
Falmouth†				6.76	
Fords Ferry†	67[c]	10[e]	38.3[e]	5.45	1.0
Frankfort†	65	11	39.2	5.28	T.
Franklin†	71	12	41.4	5.48	0.5
Georgetown	64	10	38.2		
Greensburg†	71	12	41.6	6.10	0.8
Henderson†	70	13	40.6	4.19	T.
Hopkinsville†	73	11	41.6	4.58	0.5
Leitchfield†	67	9	37.8	6.66	3.5
Lexington*‡	68	14	37.8	5.13	1.0
Louisa† *a*				7.30	
Louisa *b**‡	68	18	41.5		
Lyndon	67	9	38.4	3.78	0.5
Marrowbone†	72	13	40.8	6.39	1.0
Middlesboro†	76	13	41.2	7.13	0.3
Mount Sterling†	65	8	37.3	8.05	
Munfordville*‡	72	15	41.1		
Owensboro†	68	12	38.6	4.75	0.8
Owenton†	64[d]	9[d]	36.3[d]	5.81	0.5
Paducah *a*†				4.39	1.7
Paducah *b*†	71	10	42.0	4.53	3.0
Pilot Oak	71	10	40.9	3.02	0.1
Pleasure Ridge Park†	68	10	37.3	4.48	2.3
Princeton	71	10	40.4	6.10	2.5
Richmond†	70	12	39.2	7.68	2.0
Russellville†	75	11	42.7	4.90	0.5
St. John†	68	10	38.5	5.60	2.8
Sandyhook				4.18	4.0
Shelbyville†	67	10	37.1	5.60	1.0
South Fork				8.86	
Vanceburg†				8.40	1.0
Williamsburg†	76	15	44.4	6.68	0.5
Louisiana.					
Abbeville	79	32	56.4	4.10	
Alexandria†	81	30	54.0	4.06	
Amite†	83	30[e]	55.8[e]	7.13	
Bastrop†	85	28	54.8	3.64	
Baton Rouge†	81	31	56.4	5.06	
Calhoun	81	29[g]	51.8[d]	3.44	
Cameron†				0.93	
Cheneyville†	89	31	53.4	3.98	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Louisiana—Cont'd.	°	°	°	*Ins.*	*Ins.*
Clinton†	79	28	54.8	4.98	
Donaldsonville†	83	33	56.8	9.92	
Elm Hall	80	32	55.1	6.20	
Emilie†	79	33	55.8	5.95	
Farmerville	83[c]	26[c]	52.3[c]	2.68	
Franklin†	79	32	56.5	4.99	
Grand Coteau	79	35	57.2	3.77	
Hammond	83	32	54.3	6.66	
Houma	82	29	57.3	4.70	
Jeanerette	80	35	59.7	6.93	
Lafayette†	78	28	55.2	2.28	
Lake Charles†	76	30	55.6	2.16	
Lake Providence	80	29	53.2	4.47	
Lawrence	80	32	56.6	6.72	
Liberty Hill	86	28	54.4	3.40	
Mansfield†	84	25	52.8	1.95	0.5
Melville	79	29	54.3	6.19	
Minden	85[c]	28[c]	51.4[c]	1.28	0.1
Monroe†	79	32	52.5	3.66	
Montgomery	80	30	53.8	2.55	
New Iberia	77	32	57.2	6.38	
Oakridge†	84	26	51.4	3.73	
Oberlin	77	27	52.6	2.50	
Opelousas†	79	29	51.8	5.50	
Oxford†	82	26	54.4	2.73	
Paincourtville†	83	31	57.4	5.72	
Plain Dealing†	83	29	53.2	0.88	0.8
Rayne	80	31	55.6	3.47	
Robeline	81	24	52.2	5.43	
Ruston	82	32	53.8	3.21	
Schriever	82	30	57.8	5.48	
Shellbeach	75	37	56.6	3.56	
Southern University†	80	32	56.6	5.80	
Sugar Ex. Station†	80	34	56.6	5.92	
Sugartown†	76	31	56.1	2.81	
Thibodeaux				2.96	
Venice†	80	36	58.2	8.36	
Wallace	80	32	57.6	5.42	
Whitehall	82	30	56.6	4.81	
White Sulphur Springs	80	31	56.1	2.71	
Maine.					
Bar Harbor	50	1	25.8	2.29	15.0
Belfast*[6]	44	3	24.7	2.32	10.0
Cornish*‡	48	2	23.8	3.23	16.5
Fairfield	44	—19	21.0	1.00	9.0
Flagstaff†	39	—21	17.0	2.60	23.0
Fort Fairfield	45	—17	17.2	1.55	16.0
Gardiner	45	— 9	23.0	2.13	10.8
Kineo†	40	—12	17.9	1.95	19.5
Lewiston	46	—10	24.0	2.55	13.8
North Bridgton	45	0	22.5	3.17	17.0
Orono	43	—16	30.0	2.38	9.5
Maryland.					
Annapolis				4.68	7.0
Bachmans Valley	53	2	31.8	7.18	15.2
Boettcherville[2]			29.8	4.50	13.0
Charlotte Hall†	63	16	37.4	5.03	7.0
Cherryfields†[2]			36.4	5.59	3.0
Chestertown†	56	11	35.6	4.22	4.5
Collegepark	60[e]	10[e]	34.2[e]	6.11	1.0
Cumberland *a*	56	7	33.8	5.82	
Cumberland *b*	61	13	37.5	5.81	
Darlington†	53	11	33.4	4.20	3.5
Easton†	56	15	35.4	5.47	
Ellicott City	54	20	35.8	5.84	7.0
Fallston*‡	51	17	33.6	5.64	7.0
Flintstone	58	0	33.1	5.63	6.5
Frederick	51	9	34.3	4.77	9.2
Grantsville	57	3	29.0	7.53	31.0
Greatfalls*[5]	55	17	36.0	5.71	
Greenspring Furnace	53	4	33.2	4.78	9.6
Hagerstown†	55	13	35.6	6.17	9.5
Jewell†	61	12	36.2	5.25	2.0
Johns Hopkins Hospital	56	15	35.2	5.38	
Laurel	58	14	36.2	5.51	5.5
McDonogh[c]	51	15	33.7		
Mardela Springs†	57	13	36.8	5.14	4.2
Mount St. Marys Coll.†	52	13	32.9	3.53	5.5
New Market	54	10	34.2	5.99	8.8
Princess Anne	62	16	37.2	4.72	2.5
Sharpsburg	54	9	33.7	5.17	4.4
Solomons†	59	19	37.4	5.51	6.0
Sunnyside	59	4	29.4	9.17	24.5
Taneytown†	55	7	33.3	4.47	13.7
Van Bibber	53	16	33.5	5.57	
Western Port	60	9	33.0	4.86	9.2
Westminster	57	15	34.4	5.16	9.5
Woodstock	61	5	34.4	5.51	1.2
Massachusetts.					
Amherst	48	—10	27.0	2.52	10.8
Bluehill (summit)	48	9	27.6	2.77	12.5
Cambridge *a*	50	6	28.9	2.53	
Chestnut Hill	50	1	28.6	2.79	13.8
Concord†	51	— 6	25.7	2.52	13.1
Fallriver	50	13	30.2	2.44	11.8
Fitchburg *b*	48	2	26.6	2.86	15.0

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Massachusetts—Cont'd.	°	°	°	*Ins.*	*Ins.*
Framingham	49	— 2	28.4	2.85	
Groton	47	— 4	25.8	2.68	17.0
Hyannis*†‡	50	11	33.4	2.23	11.2
Lawrence	51	— 5	26.8	2.66	15.5
Leeds	48	—12	25.5	3.52	15.0
Leicester Hill	45	— 4	25.1	2.46	12.5
Lowell *a*	50	— 5	27.2	2.96	
Middleboro	48	0	28.2	2.14	7.8
Monson	50	— 9	27.8	3.07	15.5
New Bedford *a*	45	12	30.0	2.53	16.2
Pittsfield	44	— 2	23.9	2.78	14.0
Springfield Armory	47	— 6	25.7	2.67	14.8
Taunton *b*	47	1	28.2	3.27	15.0
Waltham				2.64	
Westboro†	50	— 7	28.4	2.75	13.5
Worcester *b*	47	10	28.4	2.95	14.0
Michigan.					
Adrian	45	1	26.9	0.83	6.8
Alma	40	— 2	25.0	1.26	14.0
Ann Arbor	45	1	25.6	1.46	12.0
Arbela	45	1	26.1	0.94	4.5
Baldwin	44	—12	23.0	1.47	13.7
Ball Mountain	44	— 3	25.6	1.63	14.5
Baraga	36	—26	17.1	0.94	31.6
Battlecreek	45	1	27.0	1.22	9.8
Bay City *b*				0.61	5.8
Benton Harbor	43	7	28.7	3.23	8.6
Benzonia	44	3	25.6	1.47	14.5
Berlin	43	— 2	24.8	1.51	13.0
Berrien Springs	47	— 6	27.6	1.55	12.5
Big Rapids	38	— 2	23.4	1.19	10.2
Birmingham	46	0	26.6		
Boon	38	— 9	21.4[c]	2.22	9.9
Bronson	45	— 3	27.2	0.81	4.0
Calumet	36	—10	20.0	1.62	18.5
Camden	45	— 2	27.6		
Carsonville	43	— 4	24.5	0.76	5.5
Charlevoix	42	— 1	23.4	1.30	13.0
Cheboygan	38	—14	20.2	1.07	10.8
Clinton	47	— 1	26.7	3.02	15.2
Escanaba†	37	—14	19.8	1.22	12.5
Fairview	41	0	23.4	1.07	10.5
Fitchburg	45	— 3	25.2	1.53	16.6
Flint	43	— 6	24.3	0.90	7.1
Gaylord	38	—15	18.6	2.22	17.8
Gladwin	39	— 5	22.9	1.45	14.5
Grand Rapids *b*	44	5	26.1	1.17	10.6
Grape	45	0	28.3	1.15	7.5
Grayling	39	— 8	20.8	0.91	10.0
Hanover	45	— 2	25.2	1.35	10.1
Harrison	41	— 7	22.6	1.46	14.2
Harrisville	45	— 7	23.4	1.67	16.5
Hart	40	4	26.4	2.04	11.0
Hastings	42	— 2	26.4	1.16	11.4
Hayes	42	2	26.1	1.09	4.9
Hesperia	50	0	26.9		
Highland Station	42	— 3	25.2	1.16	11.0
Holland*[9]	45	4	29.7		
Howell	43	2	25.0	0.97	8.2
Humboldt	33	—43	10.6	1.13	11.0
Ionia	41	— 9	25.3	0.29	3.0
Iron River	39	—35[d]	14.8[c]	0.78	5.2
Ivan[b]	38	—10	19.2	1.15	11.5
Jeddo	42	— 1	24.8	1.42	12.8
Kalamazoo	42	0	26.2	1.10	6.2
Lake City	37	— 8	21.3	1.30	10.0
Lapeer	44	0	25.2	0.92	6.0
Lathrop	36	—17	17.8	1.17	11.7
Ludington	38	4	25.6	1.25	9.8
Luzerne	40	— 5	19.8	1.62	16.2
Mackinaw City	37	—13	19.7	1.10	11.0
Madison	45	1	27.6	1.05	7.4
Mancelona	39	—13	21.0	2.33	23.8
Manistee	38	2	24.8	0.67	7.0
Manistique	36	—13	18.9	1.53	15.3
Mayville	41	0	25.0	0.98	9.0
Middle Island*[10]	40	3	25.7		
Midland	54	1	23.8		
Mottville	49	— 6	28.0	1.74	11.0
Mount Clemens	45	— 2	26.4	1.08	7.5
Mount Pleasant *b*	39	— 2	22.9	1.14	11.4
Muskegon	38	6	26.4	0.40	4.0
Newberry	37	—15	16.0	1.70	13.5
North Marshall[8]	38	— 1	23.0	0.70	6.0
Northport	48	4	24.6	1.25	12.5
Old Mission	42	2	24.2	1.64	16.4
Olivet	42	2	26.5	0.65	6.8
Omer	46[c]	0	24.8	0.55[a]	5.2[a]
Ovid	42	1	25.4	0.47	3.3
Owosso	42	1	24.3	0.84	5.0
Parkville				1.50	9.0
Petoskey	37	— 9	21.2	1.83	18.3
Plymouth	45	1	26.8	0.75	4.5
Pontiac	44	0	25.6	2.00	15.0
Port Austin	42	— 2	25.4	0.45	3.5
Powers	37	—23	19.3	1.84	18.0

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Michigan—Cont'd.	°	°	°	*Ins.*	*Ins.*
Reed City	39	−10	22.6	0.67	7.0
Rockland	39	−15	17.4	1.40	12.5
Rogers City	40	−10	20.1	1.30	10.2
Romeo	47	− 2	23.8	.....	.....
Saginaw	42	5	25.0	0.98	7.5
St. Ignace	38	−16	13.7	2.26	19.6
St. Johns	43	− 2	25.6	0.60	5.0
Sandbeach *b*	43	4	27.2	.....	.....
Sidnaw	32	−30	16.3	0.85	8.0
Somerset	43	− 1	25.3	1.31	10.2
South Haven	42	5	27.7	.....	.....
Stanton	38	− 7	24.4	0.72	6.5
Thomaston	36	−34	15.8	2.32	24.2
Thornville	44	1	26.8	1.56	17.0
Thunder Bay Island *[10]	38	4	24.5	.....	.....
Traverse City	40	− 6	24.6	1.77	15.5
Valley Center	46	− 9	23.5	0.45	2.8
Vandalia	47	− 5	28.1	2.05	15.4
Wasepi	47	− 4	28.1	1.44	6.0
Waverly	42	− 5	24.8	1.07	9.5
West Harrisville	46	− 7	21.5	1.43	14.0
Wetmore	37	−18	16.3	1.00	10.0
Ypsilanti	45	2	27.6	1.37	6.7
Minnesota.					
Ada†	33[f]	−39	6.0°	0.74	14.0
Albert Lea †	40	−26	20.2	0.60	6.0
Alexandria †	32	−29	13.8	1.39	13.9
Beardsley †	34	−24	11.5	0.82	8.2
Belleplaine *[1]	44	−26	23.3	.....	.....
Bermidji	45	−44	7.1	2.10	21.0
Bingham Lake	38	−24	18.6	.....	.....
Bird Island	38	−26	16.0	0.60	6.0
Blooming Prairie †	39	−23	18.9	0.40	4.0
Bonniwell	43	−26	17.6	0.74	14.0
Caledonia †	45	−17	21.8	0.51	4.0
Camden	40	−22	16.6	0.49	1.0
Campbell	32	−35	11.2	1.20	12.0
Collegeville	36	−23	18.0	0.64	9.7
Crookston †	32	−37	7.0	2.30	23.0
Dawson *[1]	31	−26	11.4	1.10	10.0
Detroit City	42	−46	11.4	1.07	.....
Faribault	36	−22	18.3	0.45	4.5
Farmington †	38	−28	16.5	1.35	13.5
Fergus Falls †	33	−30	12.3	0.91	9.1
Glencoe †	36	−27	13.2	0.21	.....
Glenwood †	36	−30	13.8	0.94	10.5
Grand Meadow †	36	−20	18.3	0.95	9.5
Grand Portage	31	−29	12.0	1.74	17.4
Koochiching	33	−40	7.3	2.35	.....
Lake City	41	−19	20.6	0.95	9.5
Lakeside †	38	−28	14.6	1.22	12.2
Lake Winnibigoshish [1]	33°	−36	10.1	1.62	19.2
Lambert †	38	−39	8.6	1.40	14.0
Lawrence †	.....	.....	.....	1.45	14.5
Leech Lake [1]	33°	−50	9.1	1.97	19.7
Lesueur *[1]	38	−24	19.0	0.50	5.0
Long Prairie †	37	−25	15.5	0.73	9.5
Lutsen	36	−22	17.4	1.82	.....
Luverne †	48	−21	17.6	0.25	2.5
Maplelplain	39	−24	18.2	1.34	14.0
Mazeppa [1]	38°	−30	16.3	1.70	16.0
Milaca	44	−30	17.0	2.70	27.0
Milan †	32	−31	12.0	1.32	13.2
Minneapolis *a* †	38	−24	19.2	1.05	10.5
Minneapolis *b* [1]	36°	−24	18.6	1.00	11.4
Minnesota City *† [1]	42	−20	23.0	1.00	14.0
Montevideo †	34	−25	14.2	0.80	6.0
Morris	33	−30	13.2	1.25	10.5
Mount Iron	37	−29	12.0	3.00	30.0
New London	33	−27	14.2	0.80	8.0
New Richland *[14]	36	−22	18.7	.....	.....
New Ulm †	37	−24	18.3	1.05	10.0
Park Rapids †	37	−35	10.6	1.56	15.6
Pine River [1]	41°	−32	13.7	2.57	27.1
Pleasant Mounds †	39	−25	17.9	0.52	.....
Pokegama Falls [1]	31°	−50	9.1	1.73	16.4
Rolling Green	37	−21	13.0	0.95	10.0
Roseau	34	−42	4.8	1.14	13.9
St. Charles †	39	−18	20.0	1.44	12.0
St. Cloud	34	−25	16.0	1.40	16.0
St. Olaf	34	−29	12.8	1.52	16.6
St. Peter †	38°	−25	23.8	0.10	1.0
Sandy Lake Dam [1]	32°	−37	12.9	2.45	31.4
Sauk Center	34	−30	15.8	1.20	12.0
Shakopee *	42°	−23	21.4	0.52	5.5
Tower †	40	−47	9.6	1.90	19.0
Two Harbors †	43	−22	19.3	2.58	29.0
Wabasha *[1]	40	−16	20.7	0.82	9.3
Willmar †	32	−28	13.6	0.65	5.0
Worthington	36	−22	15.8	0.79	7.9
Zumbrota [1]	45°	−26	20.7	.....	.....
Mississippi.					
Agricultural College	76	23	49.4	4.04	T.
Austin †	77	20	48.4	6.36	
Batesville †	77	22	48.8	5.24	
Bay St. Louis	78	33	57.0	8.02	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Mississippi—Cont'd.	°	°	°	*Ins.*	*Ins.*
Biloxi †	76	34	55.7	8.02	
Briers †	78	30	52.9	2.38	
Brookhaven †	82	25	54.4	5.43	
Canton †	79	29	53.4	2.38	
Columbus *a* †	.....	.....	.....	3.71	
Columbus *b*	80	18	51.3	.....	
Crystal Springs †	81	29	53.5	2.32	
Edwards	80	27	53.1	3.03	
Enterprise	82	23	53.5	5.67	
Fayette †	83	30	54.5	1.43	
French Camps †	77	32	50.8	3.20	T.
Fulton †	78	18	48.8	2.56	
Greenville *a*	75	28	49.7	4.21	
Greenville *b* †	81	25	49.8	4.05	
Hernando	76	28	46.8	.....	
Holly Springs	75	18	45.4	5.71	
Jackson †	80	25	51.0	4.24	
Lake	78	.....	.....	4.00	
Leakesville †	81	26	57.0	6.60	
Logtown †	81	32	57.6	6.72	
Louisville †	77	22	52.4	2.39	
Macon †	80	22	50.0	3.68	
Magnolia †	82	26	54.8	6.63	
Mayersville	79	32	52.6	2.43	
Meridian †	80	27	52.4	6.15	
Mosspoint	78	34	56.3	8.05	
Natchez †	82	30	56.2	1.95	
Okolona † [9]	78	23	48.6	3.87	
Palo Alto †	78	24	50.2	3.31	
Pontotoc	78	22	49.4	1.59	
Poplarville	77	31	54.6	6.83	
Port Gibson †	82	28	53.6	3.73	
Rosedale †	77	24	49.2	2.82	
Stonington *[1]	82	28	54.6	.....	
Thornton †	80	30	55.4	1.24	
Topton *[5]	80	32	55.8	4.00	
Water Valley *† [1]	76	20	47.6	3.39	
Waynesboro *b*	79	20	55.3	5.19	
Woodville †	79	32	54.5	3.75	
Yazoo City †	82	25	51.2	3.79	
Missouri.					
Akron	..	.....	.....	1.46	13.0
Appleton City	71	10	38.0	3.04	12.0
Arthur *† [3]	.....	17	34.5	3.01	8.0
Avalon	56	− 1	30.9	1.40	10.5
Bethany	58	− 5	31.9	0.98	9.0
Birchtree	72	3	37.8	1.96	T.
Bolckow †	.....	.....	.....	0.54	7.0
Boonville †	.....	.....	.....	5.57	6.0
Brunswick	60	7	32.3	1.80	11.5
Carrollton †	58	6	33.8	2.07	12.5
Conception	52	− 2	31.4	0.86	6.0
Cowgill *[5]	52	0	31.3	3.00	18.0
Darksville †	46	3	31.2	1.10	11.0
East Lynne *[3]	.....	13	33.1	3.54	18.0
Edgehill *[5]	66	0	35.2	2.67	10.0
Eightmile *[1]	62	10	36.3	2.56	13.2
Elmira	61	2	32.2	1.70	15.5
Emma *[3]	.....	10	32.6	0.85	8.5
Fairport	.....	.....	.....	0.93	7.5
Farmersville	.....	.....	.....	0.80	8.0
Fayette	63	7	33.6	1.76	12.5
Fulton	.....	.....	.....	2.25	9.0
Gallatin *[1]	51	− 1	30.7	1.21	8.0
Glasgow	60	5	33.0	2.35	12.0
Gordonville *[3]	.....	9	35.8	4.92	4.0
Gorin	.....	.....	.....	1.10	5.0
Grovedale	70	12	36.3	4.12	6.7
Halfway	70	4	37.1	1.53	3.0
Harrisonville †	62	7	32.4	1.19	10.5
Hastain	69	5	35.1	7.88	14.0
Hermann †	.....	.....	.....	2.39	9.0
Houston	72	10	38.6	4.14	7.0
Houstonia	.....	.....	.....	1.94	15.8
Humansville	73	5	38.7	3.79	4.5
Irena	.....	.....	.....	1.31	12.0
Ironton †	71	− 6	35.8	2.65	10.0
Jefferson City †	70	9	36.0	2.45	12.5
Kidder	55	− 7	30.4	1.29	10.6
Lamar †	70	13	37.6	3.33	4.5
Lamonte	.....	.....	.....	1.90	13.0
Lebanon	72	5	37.3	3.13	8.0
Lexington †	62	6	33.6	1.55	13.5
Liberty	61	5	32.4	1.60	14.7
McCune *† [1]	63	5	33.4	2.22	13.5
Macomb	.....	.....	.....	2.95	4.5
Mansfield	.....	.....	.....	3.75	7.5
Marblehill	71	4	37.6	4.97	5.0
Marshall †	62	3	32.3	1.75	15.5
Maryville	52	− 9	26.6	0.76	7.2
Mexico †	66	8	33.2	1.48	9.6
Mine La Motte †	71	− 1	37.2	2.05	4.2
Mineralspring	74	8	39.4	2.38	T.
Montreal *[1]	67	6	34.6	4.42	11.0
Mount Vernon	.....	.....	.....	4.06	2.0
Neosho	73	11	40.8	3.47	T.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Missouri—Cont'd.	°	°	°	*Ins.*	*Ins.*
Nevada *[1]	68	16	36.1	2.79	6.0
New Haven *[1]	70	12	37.5	2.82	8.0
New Madrid	71	10	41.2	5.74	T.
New Palestine *† [1]	69	10	35.6	0.84	8.5
Oakfield	72	6	36.4	3.02	7.2
Oakmound	.....	.....	.....	1.32	T.
Oakridge *[4]	.....	5	35.8	3.92	5.9
Olden †	66	6	38.2	1.69	T.
Oregon *a*	57	− 3	31.6	1.37	11.7
Oregon *b* *[1]	50	− 4	29.3	1.59	11.0
Osceola †	.....	.....	.....	2.15	1.2
Oto	.....	.....	.....	2.00	T.
Palmyra	68	4	32.5	1.70	13.0
Phillipsburg *† [1]	68	4	35.4	3.54	10.2
Pickering *[3]	68	− 4	30.7	1.57	12.0
Platte River *[3]	54	2	28.4	1.19	11.0
Poplar Bluff	72°	9°	40.0°	4.41	4.0
Potosi	63	−15	30.2	2.74	14.0
Rhineland	71	7	36.8	2.85	9.6
Richmond	59	5	32.2	1.42	12.5
Rolla	.....	.....	.....	2.45	10.5
St. Charles	74	6	35.4	2.66	8.2
St. James *[3]	.....	2	34.0	.....	9.3
St. Joseph †	.....	.....	.....	0.94	0.9
St. Louis	73	5	34.6	1.78	2.4
Sarcoxie *[3]	72	14	36.7	3.66	1.7
Sedalia	64	6	34.0	.....	.....
Seymour	64[f]	2[f]	35.2[f]	2.27	2.7
Shelbina	.....	.....	.....	1.05	8.5
Sikeston	74	13	43.0	4.44	2.0
Steffenville	.....	.....	.....	1.40	12.0
Stellada †	72	5	35.4	1.15	11.5
Sublett	55	− 4	30.0	2.10	10.0
Trenton	48	− 3	30.8	0.83	7.5
Virgil City	.....	.....	.....	3.14	8.0
Warrenton	71	4	33.5	2.45	9.0
Wheatland	.....	.....	.....	1.81	9.0
Willow Springs	74	5	39.2	1.51	1.8
Zeitonia *[1]	64	5	39.7	3.72	5.6
Montana.					
Augusta †	54	− 7	25.2	1.09	10.0
Bigtimber †	52	− 3	28.3	0.10	1.0
Boulder	43°	− 6°	21.8°	.....	.....
Bozeman †	47	2	25.0	1.00	10.0
Bozeman Exper. Stat'n.	45	3	25.1	0.70	7.0
Butte †	45	− 1	23.4	0.70	7.0
Castle	42	− 6	22.2	0.85	8.5
Chinook †	40	−16	13.4	0.20	2.0
Choteau †	50	−12	23.8	1.50	15.0
Cokedale † [2]	44	1	26.8	1.35	13.5
Columbia Falls	46	− 6	26.5	1.46	14.6
Deer Lodge	45	− 6	20.8	0.38	3.8
Ekalaka	40	−12	17.8	0.34	3.4
Fort Custer †	44	− 4	24.2	0.09	0.9
Fort Keogh †	45	−31	16.2	0.70	7.0
Fort Logan †	57	−13	23.2	0.62	6.2
Fort Missoula	43	1	22.8	1.24	4.4
Glasgow †	37	−25	7.0	0.75	7.5
Glendive †	41	−23	13.0	1.20	12.0
Greatfalls †	58	− 1	30.4	1.22	12.0
Harlem	45	−14	16.2	2.30	23.0
Hogan †	45	−10	22.5	1.90	19.0
Kalispell	43	− 2	27.2	1.33	13.3
Kipp †	45	−21	21.0	1.47	13.4
Lewistown †	61	− 5	24.1	1.84	18.5
Libby †	58	− 7	32.1	1.77	13.6
Livingston †	49	4	27.2	0.35	3.5
Manhattan †	47	−12	20.6	0.55	5.5
Martinsdale †	47	− 7	24.2	0.80	8.0
Marysville † [4]	45	0	23.0	2.53	25.1
Monarch	46	−10	25.8	0.72	.....
Poplar †	34	−26	7.3	0.60	6.0
Radersburg	53	− 6	23.5	0.75	7.5
St. Ignatius Mission †	49	6	28.6	0.82	8.1
St. Pauls †	40	−12	14.1	2.50	25.0
Sun River	48	− 6	23.2	0.65	6.5
Troy	51	7	31.9	1.85	11.5
Utica †	43	− 6	23.2	0.46	4.6
Virginia City †	44	1	23.0	1.28	13.0
Wibaux †	.....	−15	.....	0.40	4.0
Yale †	44	− 8	22.0	0.42	4.2
Nebraska.					
Agee *[1]	46	−10	23.3	1.16	11.5
Alliance *[1]	42	4	24.6	0.21	1.5
Ansley †	56	− 5	27.4	0.47	4.7
Arapaho *[1]	60	− 2	27.5	0.70	7.0
Arborville *[1]	59	−16	26.6	0.83	7.5
Arcadia	60	− 4	29.3	0.30	3.0
Ashland *a* †	62	−10	28.1	0.43	6.5
Ashland *b* *[1]	59	− 9	27.0	0.40	4.5
Ashton	56	− 7	27.6	0.46	7.0
Auburn *† [1]	54	− 7	30.6	0.99	10.0
Aurora *[1]	60	− 7	28.0	0.80	8.0
Bassett	50	−12	24.0	1.30	13.0
Beatrice †	63	− 5	27.3	0.60	6.0
Beaver City †	64	− 3	33.0	0.38	5.5

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Nebraska—Cont'd.	°	°	°	*Ins.*	*Ins.*
Benkleman	.....	.....	.....	0.57	5.8
Bluehill *1	63	— 1	29.3	0.55	5.5
Bratton *1	56[d]	— 6[e]	27.9[e]	0.70	8.0
Brokenbow *1	55	2	29.5	0.55	5.5
Burchard	.....	.....	.....	1.00	10.0
Burwell	.....	.....	.....	0.40	4.0
Callaway †	52	0	27.2	0.48	7.0
Central City *5	52	0	30.2	0.60	6.0
Chester *1	55	— 3	28.6	0.20	2.0
Columbus †	59	—12	27.0	0.66	10.0
Cornlea	.....	.....	.....	0.44	.....
Creighton †	48	—19	20.8	0.75	2.0
Crete	63	— 9	29.6	0.90	8.0
Culbertson	.....	.....	.....	0.77	7.8
Curtis *a*	74	3	33.1	0.50	2.5
David City *†	56	—12	26.6	0.50	6.0
Divide	.....	.....	.....	0.56	5.5
Dunning	.....	.....	.....	0.20	2.0
Edgar *1	52	— 7	28.2	0.55	5.8
Elba	.....	.....	.....	0.90	9.0
Ericson *† 1	45	— 9	23.8	0.50	5.0
Ewing †	.....	.....	.....	0.50	3.0
Fairbury †	64	— 4	29.2	0.20	4.5
Fairmont *† 1	60	— 6	29.4	0.84	8.4
Filley	.....	.....	.....	0.65	6.5
Fort Robinson	52	5	26.2	T.	T.
Franklin †	50[i]	0	30.8[e]	0.55	5.5
Fremont †	57	—14	28.0	0.60	6.0
Geneva †	63	—10	28.4	0.93	7.5
Genoa	54	—12	26.4	0.64	7.4
Gering †	60	— 1	29.2	0.30	2.3
Gothenburg	56	3	28.6	0.70	7.0
Grand Island *a* *1	56	— 5	31.6	0.80	8.0
Grand Island *b*	59	— 6	28.8	0.69	6.7
Greeley *1	45	— 9	24.0	0.50	5.0
Haigler *1	52	12	28.8	T.	T.
Hartington †	45	—20	20.2	0.54	4.8
Harvard *1	60	—10	26.8	0.60	6.5
Hastings *1	60	— 8	28.4	0.85	9.0
Hayes Center	.....	.....	.....	0.34	3.5
Hay Springs	48	— 2	25.6	0.50	5.0
Hebron †	66	— 5	27.4	0.42	2.8
Hickman	.....	.....	.....	0.40	4.0
Holdrege *b* *1	63	1	30.9	1.01	11.0
Imperial *a* †	65	— 1	30.7	0.70	7.0
Indianola (near) *1	62	4	30.0	0.47	4.8
Kearney *5	50	— 1	28.6	0.99	10.2
Kennedy	51	—12	24.3	0.36	6.0
Kimball †	55	— 3	29.0	0.75	7.5
Kirkwood *1	50	— 9	19.8	0.92	8.0
Lexington †	56	— 6	29.8	0.81	5.5
Lincoln *b* †	62	— 8	28.0	0.84	8.3
Lincoln *d*	49	— 8	26.6	0.77	5.8
Lodgepole †	55	— 4	27.8	0.40	4.0
Loup *a* *1	52	0	28.2	0.40	4.0
Loup *b* *1	54	— 4	27.3	0.43	2.0
Lynch *† 1	52	—17	22.5	0.48	5.2
Lyons	43	—13	24.1	0.84	8.2
McCook *1	62	4	30.0	1.00	5.0
McCool	.....	.....	.....	0.49	.....
Madison *1	55	—13	25.3	0.61	3.5
Madrid *5	55	5	29.6	0.20	2.0
Marquette	.....	.....	.....	0.77	7.8
Minden *a* *1	64	— 8	27.9	1.25	12.0
Minden *b*	.....	.....	.....	0.94	.....
Nebraska City *a*	62[e]	—12[d]	27.2[e]	0.69	4.5
Nebraska City *b*	.....	.....	.....	0.55	5.0
Nemaha *1	49	— 7	27.1	0.96	10.0
Nesbit	50	1	27.1	0.35	.....
Norfolk †	44	—20	23.0	0.43	2.7
Norman	61	—10	29.4	1.18	9.0
North Loup †	56	— 6	28.6	0.36	.....
Oakdale †	50	—13	23.7	0.51	3.8
Odell *5	58	— 4	30.8	0.42	4.2
O'Neill †	59	—16	24.2	0.48	7.0
Ord	50	— 6	27.2	0.42	5.0
Osceola	.....	.....	.....	0.60	6.0
Ough †	.....	.....	.....	T.	T.
Palmer *b*	.....	.....	.....	0.50	5.0
Plattsmouth *a* †	.....	.....	.....	0.72	6.0
Ravenna *a*	57	— 4	28.4	0.88	7.5
Ravenna *b* *1	56	1	31.5	0.75	7.5
Redcloud *a*	.....	.....	.....	0.96	4.0
Redcloud *b* *1	54	— 4	31.9	0.39	5.0
Republican *1	63	1	31.3	0.60	6.0
Rulo *1	54	— 2	34.1	0.90	9.0
St. Libory	58	— 8	29.6	0.80	6.5
St. Paul	56	— 4	30.6	0.72	4.5
Salem *1	48	2	30.8	0.70	7.0
Santee Agency †	45	—16	22.0	0.44	3.5
Sargent	.....	.....	.....	0.72	6.5
Schuyler	.....	.....	.....	0.70	7.0
Seneca *1	55	— 2	30.4	0.40	4.0
Seward *1	60	— 9	28.5	0.60	6.0
Springfield *1	60	—11	26.6	0.53	5.4
Stanton *1	50	—14	24.8	0.49	4.0
State Farm	62	—10	28.0	.....	.....
Strang *1	64	— 8	28.8	0.90	9.0
Stratton	.....	.....	.....	0.52	.....
Stromsburg	.....	.....	.....	0.94	.....
Superior *5	62	— 4	29.0	0.25	4.0
Sutton	64	— 7	27.6	1.59	15.6
Syracuse	.....	.....	.....	0.04	.....
Tecumseh *b* †	58	6	28.4	0.48	5.5
Tekamah	55	—14	24.2	0.80	8.0
Thedford *1	56	— 8	26.2	0.55	5.5
Turlington †	60	— 9	26.8	0.40	6.2
Valentine †	48	— 8	24.6	1.94	.....
Wakefield	.....	.....	.....	0.44	3.0
Wallace *1	52	1	30.6	0.50	5.0
Weeping Water *1	59	— 9	25.5	0.46	3.8
Westpoint	51	.....	.....	0.54	.....
Whitman	.....	.....	.....	0.50	5.0
Wilber *1	62	— 2	30.8	0.60	6.0
Wilsonville *1	66	— 4	31.3	0.45	4.0
Wisner	.....	.....	.....	0.43	4.0
Woodlawn	.....	.....	.....	0.52	.....
York *1	50	— 9	27.8	1.10	11.0
Nevada.					
Austin	47	1	27.8	2.11	16.0
Battle Mountain *1	48	2	29.6	1.66	14.5
Beowawe *1	54	— 4	29.2	1.14	8.0
Candelaria	65	10	35.3	0.65	2.5
Carlin *1	46	—12	27.8	0.78	8.5
Carson City	56	—14	30.0	4.17	32.3
Cloverdale *1	55	10	30.6	0.62	7.0
Clover Valley	.....	.....	.....	3.05	22.0
Cranes Ranch	.....	.....	.....	2.13	13.0
Darrough Ranch	.....	.....	.....	1.14	8.0
Downeyville	67	9	36.2	2.04	14.0
Duckwater	56	— 6	37.8	0.89	15.0
Elko *5	52	2	27.1	2.50	17.7
Ely	55	—22	23.4	3.75	33.0
Empire Ranch	50	—16	23.8	1.82	14.5
Fenelon *1	46	— 8	23.0	2.35	17.0
Golconda *1	50	2	30.4	1.19	8.5
Halleck *1	48	— 7	24.0	2.15	16.2
Hawthorne *a* *5	57	20	36.2	1.00	8.0
Hawthorne *b*	59	9	34.9	0.61	8.0
Hot Springs *1	50	5	34.5	0.67	7.0
Humboldt *1	58	9	35.2	1.34	10.2
Keysers Springs	.....	.....	.....	1.27	12.0
Lewers Ranch	55	0	31.2	5.35	27.2
Los Vegas	57	26	41.1	1.67	2.0
Lovelock *1	42	22	29.8	1.21	13.0
Midas	58	5	30.6	2.04	18.0
Mill City *1	55	10	29.8	1.26	6.0
Osceola	52	— 2	28.4	3.05	32.5
Palisade *1	52	8	35.1	2.45	16.2
Palmetto	56	— 4	30.4	2.65	20.0
Reese River	.....	.....	.....	1.79	14.0
Reno *5	48	— 6	33.5	.....	32.5
Reno State University	58	—12	27.8	2.10	22.9
Ruby Valley	.....	.....	.....	1.84	14.3
St. Clair	52	4	31.9	1.56	12.0
St. Thomas	67	24	46.8	1.91	.....
San Antonio	58	3	30.8	0.97	2.9
Tecoma *1	49	10	29.7	0.57	6.5
Toano *1	52	2	25.8	1.72	17.5
Tuscarora	42	— 4	22.4	4.77	18.0
Tybo	45	— 5	25.9	2.03	27.0
Verdi *1	52	— 3	29.9	4.99	23.5
Wadsworth *1	62	— 3	30.3	2.33	20.5
Wells	46	—19	24.4	1.34	11.6
New Hampshire.					
Bethlehem	44	— 7	21.0	1.52	13.5
Concord	47	—11	25.4	2.49	16.0
Grafton †	44	—14	21.0	2.56	14.0
Hanover	43	—14	20.2	1.64	9.3
Keene	48	—13	22.6	1.79	13.2
Lancaster	48	—24	17.0	1.86	19.8
Nashua	50	—11	25.5	2.88	14.0
North Conway	48	—19	23.6	4.08	20.0
Peterboro	46	—17	21.8	3.23	15.0
Plymouth	44	—18	20.0	2.79	15.5
Sanbornton †	43	— 4	22.5	2.13	15.0
Stratford	47	—18	21.4	1.46	13.5
Warner	.....	.....	.....	3.25	19.2
West Milan	42	—27	17.0	2.20	19.0
New Jersey.					
Allaire	56	6	35.2	.....	.....
Asbury Park	53	10	33.1	2.39	5.0
Barnegat	65	11	34.3	3.71	9.5
Bayonne	56	5	32.9	2.74	10.0
Beachhaven	50	18	34.3	3.82	3.0
Belvidere	50	— 3	30.2	2.90	11.0
Beverly †	57	10	33.6	3.36	9.0
Billingsport *1	48	15	34.0	5.01	6.0
Blairstown	55	0	30.8	2.50	10.8
Boonton	51	5	29.9	3.71	12.2
Bridgeton	55	16	37.0	5.72	4.0
Camden	52	12	33.1	2.87	7.1
Cape May	54	18	35.4	6.37	3.5
Cape May C. H. †	57	17	36.2	6.12	4.0
Charlotteburg	49	— 3	28.6	4.99	10.0
Chester	48	10	29.6	4.10	10.0
Clayton	55	8	34.0	4.46	4.5
College Farm †	52	2	32.0	2.77	11.9
Deckertown	51	— 4	29.2	2.38	8.0
Dover	52	— 1	30.0	3.94	12.0
Egg Harbor City	59	11	33.6	4.38	2.5
Elizabeth †	57	8	32.4	2.98	11.0
Englewood	56	— 4	30.1	3.59	14.0
Franklin Furnace	49	— 5	27.4	3.01	10.0
Freehold	55	12	32.8	4.35	5.5
Friesburg	.....	.....	.....	4.18	5.0
Gillette	54	0	29.6	2.55	6.5
Hammonton	.....	.....	.....	4.26	4.0
Hanover	51	0	31.0	3.00	10.0
Hightstown	54	2	32.4	3.47	8.5
Imlaystown	53	8	32.8	3.70	7.0
Junction	.....	.....	.....	2.59	7.5
Lambertville	52	2	32.2	3.00	20.0
Moorestown	55	10	33.8	3.58	6.0
Newark *a*	53	10	33.2	2.30	9.0
Newark *b* †	54	11	32.8	2.95	8.5
New Brunswick *a*	56	3	33.8	3.15	6.2
New Brunswick *b*	53	2	32.0	3.08	11.9
Newton	53	3	29.8	2.95	9.0
Ocean City	55	18	35.4	4.33	.....
Oceanic	52	15	34.8	2.81	7.1
Paterson	58	10	34.0	3.55	11.5
Plainfield	55	4	31.9	3.13	8.0
Rancocas	.....	.....	.....	3.57	7.4
Readington *1	52	10	34.5	.....	.....
Rivervale	48	— 6	29.4	3.41	15.0
Sergeantsville	51	8	31.8	2.86	7.0
Somerville	56	— 4	31.2	3.04	5.5
South Orange	53	8	31.4	2.57	10.5
Staffordville	.....	.....	.....	3.93	4.0
Toms River	57	— 3	32.3	4.86	7.0
Trenton	54	10	36.8	3.28	9.0
Vineland	56	9	34.8	5.38	2.8
Woodbine	57	7	32.5	5.66	1.5
New Mexico. §					
New York.					
Adams	.....	.....	.....	1.41	.....
Addison	50	— 7	27.9	0.76	5.0
Akron	.....	.....	.....	2.50	.....
Angelica †	46	— 8	24.7	1.57	7.0
Appleton	43	0	26.6	1.93	4.5
Arcade	44	2	24.4	1.76	9.5
Atlanta	.....	.....	.....	0.83	.....
Avon	43	2	26.0	0.64	.....
Baldwinsville	46	2	25.7	0.99	5.5
Bedford	51	— 4	29.7	3.09	15.3
Big Sandy *10	40	— 4	22.6	.....	.....
Binghamton †	50	—10	25.9	2.09	13.7
Bolivar	46	— 5	25.7	1.44	5.0
Boyds Corners	.....	.....	.....	3.14	11.8
Brentwood	54	0	30.6	2.08	12.8
Brooklyn	52	17	33.2	3.20	9.0
Canajoharie	44	— 3	25.3	1.44	13.0
Canton	42	—16	18.8	1.65	9.5
Carmel	50	— 2	27.1	2.76	10.8
Catskill	49	— 4	26.9	3.28	12.0
Charlotte *10	38	8	24.4	.....	.....
Cherry Creek	.....	.....	.....	2.89	.....
Cooperstown †	44	—10	21.3	2.06	14.5
Cortland	46	0	25.0	1.11	.....
De Kalb Junction	.....	.....	.....	1.02	.....
Demster	.....	.....	.....	1.20	.....
Dryden	43	2	24.6	0.59	.....
Eagle Mills	.....	.....	.....	2.05	.....
Easton	.....	.....	.....	1.43	.....
Elmira †	51	— 1	28.8	0.93	6.5
Fleming	47	6	26.8	1.40	10.0
Fort Niagara †	44	6	27.6	1.70	8.5
Franklinville	44	— 7	24.3	2.01	4.4
Friendship	48	— 6	26.8	1.56	4.8
Fulton	.....	.....	.....	1.14	.....
Garrattsville	47	1	24.3	1.43	12.0
Glens Falls	46	— 8	22.6	1.86	12.0
Gloversville	41	— 7	23.0	2.03	11.6
Haskinsville	.....	.....	.....	0.63	.....
Honeymead Brook	47	— 4	25.2	2.61	13.3
Humphrey †	48	3	26.8	2.56	12.5
Ithaca	49	7	26.9	0.91	7.1
Jamestown	45	4	28.2	2.23	11.0
Kings Station	.....	.....	.....	1.75	.....
Lake George	51	—12	21.1	2.48	15.2
Lebanon Springs	49	— 6	23.6	2.50	11.0
Little Falls	39	— 4	21.0	1.73	12.8
Lockport	46	6	28.8	2.70	27.0
Lowville	41	— 9	20.8	1.75	16.0
Lyons	48	8	27.6	0.95	6.5
Madison Barracks †	45	— 7	20.2	1.79	21.8
Manhattan Beach †	48	12	30.8	2.42	5.0

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
New York—Cont'd.	°	°	°	*Ins.*	*Ins.*
Mohonk Lake	46	10	26.2	3.02	11.0
Mount Morris	.....	.....	.....	1.00	7.0
Newark Valley	.....	.....	.....	1.34	.....
New Lisbon	44	−13	21.8	1.53	10.5
Niagara Falls	.....	.....	.....	2.07	.....
North Hammond †	44	− 4	21.3	1.35	11.6
North Lake	41[g]	−20[c]	18.4[d]	2.10	20.0
Number Four †	40	−10	20.0	3.21	27.2
Ogdensburg	44	− 8	21.0	1.79	10.0
Oneonta	49	− 4	27.3	2.09	.....
Oxford	47	− 8	26.2	2.09	12.5
Palermo †	45	− 2	23.1	1.14	6.8
Perry City	49	− 2	23.6	1.33	11.1
Phœnix	.....	.....	.....	1.25	.....
Pine City	.....	.....	.....	0.78	.....
Pittsford	46	5	26.5	2.45	.....
Plattsburg Barracks †	44	− 9	17.8	1.43	.....
Port Jervis	48	− 3	28.1	3.00	14.5
Potsdam	42	− 7	18.8	2.80	28.0
Poughkeepsie	49	−11	25.6	2.66	12.5
Primrose	56	− 6	29.6	2.24	10.0
Ridgeway	43	6	25.1	1.66	8.6
Rome	46	− 3	22.2	1.69	.....
Romulus	50	7	27.8	0.93	6.5
Rose	.....	.....	.....	1.83	.....
St. Johnsville	42	− 4	23.0	1.04	2.7
Saranac Lake	50	−28	17.5	1.50	19.8
Setauket †	47	9	31.2	2.56	10.0
Sherwood	.....	.....	.....	1.10	.....
Skaneateles	.....	.....	.....	1.45	.....
South Canisteo	50	0	26.8	1.60	13.0
Southeast Reservoir	.....	.....	.....	2.66	9.5
South Kortright †	46	−13	23.2	1.53	.....
Straits Corners	44	− 3	23.3	1.39	12.0
Wappingers Falls	54	−13	27.2	2.66	13.5
Warwick	.....	.....	.....	2.21	.....
Waverly †	54	− 9	27.7	1.67	7.2
Wedgwood	51	4	26.4	0.87	7.2
Westfield	46	5	28.1	1.59	4.5
Westpoint †	47	− 1	27.6	3.35	16.0
Willetspoint	47	9	30.6	4.68	9.3
North Carolina.					
Asheville †	72	14	41.2	6.35	T.
Beaufort †	69	30	51.1	6.50	
Biltmore †	76	14	42.4	6.73	T.
Bryson City †	.....	.....	.....	6.96	
Chapelhill †	76	22	49.3	5.66	
Edenton †	72	25	46.2	4.79	T.
Experimental Farm	74	26	46.5	4.14	
Fairbluff †	.....	.....	.....	8.64	
Falkland	.....	.....	.....	6.51	T.
Fayetteville †	79	21	47.8	3.63	
Greensboro †	75	20	45.8	5.66	
Henderson †	73	22	44.8	4.92	T.
Highlands	66	9	38.4	5.56	1.0
Horse Cove †	68	14	42.5	9.76	T.
Jacksonville †	79	25[d]	51.5	6.46	
Lenoir *† [1]	72	18	42.5	8.35	
Linville †	61	9	34.1	10.23	9.0
Littleton †	73	20	42.7	5.60	
Louisburg †	75	20	44.8	4.90	
Lynn *† [2]	73	.....	42.6	7.22	
Marion	76	17	45.9	4.61	2.0
Mocksville	74	20	46.5	4.80	T.
Moncure †	75	22	46.4	4.32	
Monroe †	76	20	46.2	5.85	
Morganton *† [1]	70	16	39.0	7.27	
Mountairy †	71	16	41.6	6.93	
Mount Pleasant	76	27	46.0	5.26	
Murphy †	.....	.....	.....	6.02	0.3
Newbern †	77	32	52.6	4.12	
Oakridge †	71	20	42.9	5.12	
Pantego *[3]	77	26	44.3	5.38	T.
Pittsboro †	75	16	43.0	5.61	
Rockingham †	80	23	48.4	6.55	
Roxboro †	71	18	41.8	5.92	
Salem †	73	16	43.4	5.52	
Salisbury †	74	22	46.8	4.61	
Saxon †	71[g]	14[g]	43.0[g]	6.28	
Selma	75	25	46.2	6.55	
Settle	72	16	42.6	5.61	T.
Skyuka	65	14	40.1	7.28	
Sloan †	78	23	49.4	6.18	
Soapstone Mount †	74[c]	17[c]	45.2[c]	6.65	
Southern Pines *a †	77	22	50.2	6.79	
Southern Pines *b	76	23	48.0	6.75	
Southport †	70	27	51.2	5.44	
Springhope *†	70	25	44.3	3.40	T.
Tarboro	76	19	45.4	4.61	
Waynesville †	69	13	41.8	5.70	T.
Weldon †	72	21	44.0	5.47	T.
Willeyton	73	23	45.1	6.17	T.
North Dakota.					
Amenia	32	−33	6.1	1.40	14.0
Ashley †	36	−31	7.4	1.10	11.0
Buxton	34	−29	5.8	0.66	6.6
Churchs Ferry	29	−35	2.4	1.35	13.5
Coalharbor †	33	−24	5.2	1.13	11.3
Devils Lake †	40	−34	4.2	0.46	4.6
Dickinson †	38	−29	11.2	1.20	12.0
Falconer	39	−28	8.3	.....	.....
Fargo †	31	−34	5.0	0.77	7.7
Forman †	36	−30	7.5	0.79	8.0
Fort Berthold †	38	−29	1.8	2.18	21.8
Fort Yates †	41	−25	9.6	1.00	10.0
Gallatin †	31	−40	4.6	0.94	9.0
Glenullin †	.....	.....	.....	0.60	6.0
Grafton †	33	−32	2.8	2.20	22.0
Grand Rapids †	34	−32	6.2	2.87	28.7
Hamilton	33	−37	0.0	0.89	8.5
Jamestown †	38	−24	10.0	2.00	20.0
Larimore †	33	−31	5.7	0.30	3.0
McKinney	34	−38	−1.2	1.04	11.0
Mayville °	42	.....	9.8	0.60	6.0
Medora †	42	−34	11.6	0.95	9.5
Milton †	32	−33	2.8	1.10	11.0
Minot †	37	−34	3.4	0.48	5.6
Minto †	36	−31	5.1	0.97	9.7
Napoleon †	32	−30	6.0	0.80	8.0
New England City †	.....	.....	.....	1.40	14.0
Oakdale †	40	−16	13.1	1.40	14.0
Portal †	33	−30	3.6	1.40	14.0
Power †	32	−39	6.8	1.10	11.0
St. John †	34	−24	4.9	2.10	21.0
Sheyenne	32	−32	3.6	0.70	7.0
Steele †	35	−31	7.0	1.60	16.0
Towner †	30	−37	3.0	.....	.....
University †	34	−30	5.5	0.92	9.2
Valley City †	.....	.....	.....	1.45	14.5
Wahpeton †	38	−33	11.6	0.95	9.5
Wildrice † [2]	.....	.....	6.2	1.56	15.6
Willow City †	31	−39	1.0	0.40	4.0
Woodbridge †	32	−33	1.9	0.61	6.1
Ohio.					
Akron	53	3	30.6	2.65	4.0
Annapolis	58	3	32.4	3.46	3.0
Ashland	53	2	29.7	2.51	6.5
Ashtabula	47	5	28.6	2.35	7.0
Atwater	.....	.....	.....	3.87	4.0
Auburn	44	0	23.8	2.05	.....
Bangorville	55	− 3	29.4	2.56	2.5
Basil	.....	.....	.....	3.23	3.0
Bellefontaine	59	14	33.0	.....	.....
Bement	.....	.....	.....	1.81	4.5
Benton Ridge	57	0	31.6	0.86	4.2
Bethany	61	9	36.6	5.16	3.5
Bigprairie	55	1	31.0	2.19	1.5
Binola	54	4	32.1	1.83	4.5
Bissells	48	2	28.4	2.33	6.9
Bloomingburg	64	4	34.2	5.40	4.0
Bowling Green	51	2	29.6	1.07	3.7
Cambridge	60	4	32.6	4.75	3.0
Camp Dennison	63	11	36.6	4.78	4.2
Canal Dover	59	0	31.8	4.25	2.5
Canton †	54	1	31.6	3.60	4.1
Carrollton	58	2	31.8	2.73	T.
Cedarville	.....	.....	.....	4.61	0.5
Celina	58	4	34.4	0.35	3.5
Cherryfork	66	3	35.4	7.67	T.
Circleville	66	7	37.0	5.11	4.0
Clarksville	62	6	34.5	5.16	3.8
Cleveland *a	52	4	30.6	1.54	5.2
Cleveland *b	53	4	29.6	1.46	4.2
Coalton	68	9	37.4	7.57	T.
Colebrook	48	− 3	27.9	2.40	3.0
Dayton *a	59	6	35.2	3.35	5.5
Dayton *b †	.....	.....	.....	3.00	4.1
Defiance	49	1	29.6	1.03	4.8
Delaware †	58	3	32.7	2.73	2.8
Demos	58	5	32.2	4.01	2.0
Dupont	49	0	29.7	1.14	7.0
Elyria	52	2	30.2	1.88	4.1
Fairport Harbor *[10]	48	8	31.2	.....	.....
Fayetteville	60	8	35.0	5.48	2.3
Findlay	56	0	30.1	1.15	5.9
Fostoria	53	2	30.2	0.94	6.0
Frankfort	65	7	35.9	6.56	2.0
Garrettsville †	52	− 5	29.0	3.09	2.2
Gratiot	60	5	34.1	3.94	3.4
Greenfield	62	10	36.8	4.88	3.0
Greenhill	56	− 9	30.4	3.44	2.5
Greenville	55	3	31.6	2.45	6.5
Hackney	60	5	36.2	5.91	1.0
Hanging Rock	64	14	38.2	8.17	1.5
Hedges	.....	.....	.....	1.44	10.0
Hillhouse	50	2	27.3	2.27	9.5
Hillsboro †	66	6	36.2	5.14	2.0
Hiram	49	− 1	27.7	3.01	3.5
Hudson	52	− 4	28.2	2.80	.....
Jacksonboro	64	6	33.2	3.85	13.0
Kenton †	59	0	32.6	2.33	6.1
Killbuck	57	0	30.8	3.28	.....
Ohio—Cont'd.					
Lancaster	63	6	34.9	5.79	2.0
Leipsic	52	1	29.6	1.61	5.5
Levering	56	0	28.6	2.32	1.5
Logan	68	4	36.2	6.70	0.2
Lordstown	49	− 4	29.4	2.80	3.5
Lowell	65	7	36.8	6.14	0.5
McArthur	64	8	35.5	6.53	T.
McConnelsville †	66	6	35.7	6.73	3.0
Mansfield †	.....	.....	.....	3.37	5.0
Marietta *a †	.....	.....	.....	6.22	T.
Marietta *b	65	10	38.5	6.36	0.5
Marion	58	1	32.0	2.02	2.2
Medina	56	− 3	30.0	2.20	5.0
Milfordton	56	− 1	28.7	3.03	4.0
Milligan	61	2	35.1	6.25	4.0
Millport	.....	.....	.....	2.99	1.0
Montpelier	45	0	27.4	1.65	9.8
Napoleon	48	1	28.6	1.95	6.5
Neapolis	.....	.....	.....	0.95	5.9
New Alexandria	55	4	32.2	4.10	3.0
New Berlin	53	− 3	30.0	2.32	1.0
New Bremen	56	− 3	28.7	0.46	4.5
New Comerstown	59	4	33.5	3.77	2.5
New Holland	60	5	34.4	5.54	4.5
New Moscow	.....	.....	.....	3.40	.....
New Paris	55	3	32.2	2.06	4.0
New Waterford	.....	.....	.....	4.81	4.0
North Lewisburg	56	1	31.2	2.90	5.5
North Royalton	52	2	29.7	1.66	.....
Norwalk	58	− 2	29.6	0.60	1.0
Oberlin	41	0	29.0	0.65	4.5
Ohio State University	59	5	33.5	4.11	2.0
Orangeville	52	− 6	28.6	2.10	1.0
Ottawa	53	2	32.2	1.43	7.5
Pataskala †	60	3	33.9	4.23	2.8
Perry	.....	.....	.....	3.02	8.0
Philo	62	3	33.2	4.66	2.5
Plattsburg	59	2	32.7	3.33	4.1
Pomeroy	63	10	37.8	6.24	1.0
Portsmouth *a †	.....	.....	.....	7.90	T.
Portsmouth *b	72	12	39.9	8.70	0.6
Richwood	.....	.....	.....	3.36	5.0
Ridgeville Corners	46	0	27.9	1.33	6.0
Ripley	63	9	36.6	7.11	1.9
Rittman	53	− 1	28.6	1.71	1.0
Rockyridge	53	1	29.6	1.02	2.8
Rosewood	54	1	31.6	3.37	5.0
Sharon Center	.....	.....	.....	1.22	2.0
Shenandoah	52	0	29.6	1.59	2.5
Sidney *b	47	− 1	30.0	2.07	5.6
Sinking Spring †	61	18	36.4	6.20	2.0
Springboro	.....	.....	.....	3.35	3.0
Spring Valley	61	0	32.7	4.12	0.5
Strongsville	.....	.....	.....	2.19	6.3
Sylvania	44	4	28.0	1.26	10.0
Thurman	69	9	40.0	6.78	.....
Tiffin †	53	4	31.0	2.38	6.2
Upper Sandusky	55	2	31.4	2.16	6.5
Urbana	56	4	32.3	3.02	5.0
Vanceburg	68	11	37.6	7.35	T.
Van Wert	53	− 1	29.6	1.63	8.7
Vermilion	50	0	29.1	1.53	5.5
Vickery	52	1	30.8	1.12	4.7
Walnut	.....	.....	.....	4.55	3.0
Warren	52	− 1	30.0	2.97	2.4
Wauseon	46	1	29.0	1.35	9.9
Waverly	68	8	36.0	7.54	1.3
Waynesville	60	5	31.9	4.05	3.5
Wellington	53	2	29.6	1.75	4.5
Westerville	58	6	33.9	3.28	3.3
Wooster *a	54	0	30.0	2.64	5.5
Wooster *b †	.....	.....	.....	2.58	2.0
Youngstown	48	− 1	29.6	1.57	2.0
Oklahoma.					
Alva	.....	.....	.....	1.55	0.5
Anadarko †	80	15	45.4	.....	.....
Arapaho †	72	14	39.8	0.46	2.3
Burnett †	77	15	41.8	1.20	
Clifton †	73	13	41.6	1.25	T.
Edmond	72	18	40.7	1.86	T.
Fort Reno †	75	12	42.6	1.55	
Fort Sill	76	20	44.0	0.39	
Guthrie †	66	22	42.8	2.11	0.1
Hennessey †	77	18	42.7	0.79	T.
Keokuk Falls °	76	19	46.8	1.00	
Mangum †	80	17	45.6	0.26	0.5
Norman †	76	19	44.5	1.15	1.0
Ponca	.....	.....	.....	1.48	T.
Pondereek †	90	12	41.8	1.02	2.0
Prudence †	78	15	41.7	1.50	3.5
Sac and Fox Agency †	78	15	40.7	1.30	
Stillwater †	76	17	41.4	1.51	T.
Waukomis	73	10	40.1	0.24	T.
Winnview †	74	15	39.9	0.81	0.5
Woodward	70	17	36.4	.....	6.0

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Oregon.	°	°	°	*Ins.*	*Ins.*
Albany *a*	59	30	44.1	6.30	T.
Arlington	57	24	39.8	1.13	
Ashland *b*	68	21	41.0	3.96	4.0
Aurora *[8]	65	32	47.6	5.86	
Aurora (near)	63	26	42.7	6.17	T.
Bandon	56	28	46.1	5.54	0.5
Bay City †	58	26	44.0	14.69	
Brownsville *[8]	58	30	45.6	4.90	
Burns †	49	−11	24.2	1.10	11.0
Canyon City		10		1.36	9.0
Cascade Locks	54	30	41.4	14.37	4.5
Comstock *[8]	60	27	43.3	6.35	0.5
Corvallis *a*	62	29	42.7	6.98	0.8
Dayville †	63	18	37.6	1.85	5.5
Eugene *a* †	59	30	43.4	4.31	0.6
Falls City				12.67	0.5
Fife †	51	2	28.7	1.76	6.0
Forest Grove	63	26	42.2	7.98	
Fort Klamath	51	−1	29.2	5.81	27.8
Gardiner	60	31	46.0	14.77	
Glenora	61	27	40.2	20.90	10.3
Grants Pass *a* †	71	24	43.0	5.88	2.0
Happy Valley	55	−3	30.3	2.53	7.0
Hood River (near)	50	23	37.4	7.45	14.0
Irvington				5.27	
Jacksonville	63	24	40.6	5.59	0.5
Joseph	45	5	26.0	1.25	12.0
Junction City *[8]	58	28	44.1	5.07	
Lakeview †	50	2	29.6	2.95	19.5
Langlois	67	31	48.1	16.51	
McMinnville †	63	27	42.1	7.35	T.
Merlin *[8]	66	24	40.0	6.15	1.0
Monmouth *[8]	60	29	43.1	6.04	
Mount Angel †	62	28	42.8	6.84	T.
Nehalem				17.97	0.8
Newberg	65	28	43.1	7.81	T.
Newport	62	31	44.6	14.16	
Pendleton	60	21	39.0	2.47	3.5
Prineville	63	6	36.1	1.14	6.8
Riddles *[8]	62	28	41.5	5.03	
Salem *b* †		28		5.73	
Sheridan *[8]	59	30	44.0	6.51	
Silver Lake	53	−2	30.9		
Silverton *[8]	52	28	42.3	6.67	
Siskiyou *[8]	63	19	36.7	7.20	29.0
Sparta	45	3	27.6	6.70	64.5
Springfield *[8]	52	28	42.4	5.35	1.0
Stafford	65	25	41.9	7.12	0.1
The Dalles †	63	26	40.5	2.98	4.0
Tillamook Rock L. H.				8.13	
Toledo	56	25	41.8	17.46	1.0
Vale	53	19	34.6	1.90	4.0
Vernonia	61	28	41.0	7.77	3.0
West Fork *[8]	60	26	40.2	8.81	
Weston	53	23	36.8	3.13	3.8
Williams	66	21	41.2	5.92	
Pennsylvania.					
Altoona	60	12	35.6	2.09	
Aqueduct	59	1	32.9	2.70	10.8
Beaver Dam				2.63	
Bethlehem				2.57	10.0
Blooming Grove	42	−4	25.1	3.59	12.9
Brookville †				0.93	6.05
Browers Lock				4.34	
Cameron				1.76	
Canonsburg	62[c]	7[c]	35.3[c]	1.54	1.5
Carlisle	51	8	31.2	3.42	15.0
Cassandra	52	8	30.9	3.43	19.5
Cedarrun				1.87	8.0
Centerhall †	53	3	29.4	4.17	13.8
Chambersburg †	49	0	29.8	4.07	5.0
Coatesville	56	3	32.4	4.91	18.2
Confluence †	56	0	29.8	5.88	8.0
Coopersburg	56	8	34.5	3.73	18.8
Davis Island Dam †				4.11	
Derry Station				5.11	11.5
Doylestown				3.73	
Drifton [c]	45	−1	27.8	2.24	10.0
Driftwood				2.18	
Dubois				2.83	7.9
Duncannon				6.27	12.0
Dunmore	51	−1	27.3	1.84	8.5
Dushore	64	−4	28.6	1.50	8.0
Dyberry †	46	−10	25.0	3.06	16.0
East Bloomsburg				1.53	13.0
East Mauch Chunk	51	−1	29.8	3.74	12.5
Easton	47	2	31.1	1.28	11.5
Edinboro *[1]	43	−2	24.7		20.0
Ellwood Junction †				2.81	1.0
Emporium	51	7	29.5	3.20	9.9
Farrandsville				1.83	10.5
Forks of Neshaminy *[1]	50	10	33.9	2.94	4.0
Franklin	50	−1	28.2	2.50	3.0
Frederick				3.07	
Freeport †				3.99	
Gettysburg [c]	58	10	33.5	1.17	0.8
Pennsylvania—Cont'd.					
Girardville				3.46	12.2
Grampian	48	4	26.8	2.78	19.0
Greensboro †	63	1	35.6	4.86	1.0
Greenville	48	0	28.6		
Hallstead †	50	−7	27.4	1.76	12.1
Hamburg	48	9	32.6	4.61	13.0
Hollidaysburg	61	−4	30.7	4.58	16.2
Huntingdon *a* †	56	−1	32.7	4.69	
Huntingdon *b*				3.65	10.3
Indiana	67	5	35.2	1.55	8.0
Irwin	65	12	38.5	4.10	T.
Johnstown †	55	1	31.9	4.05	10.0
Karthaus				1.60	9.0
Keating				2.15	6.7
Kennett Square	55	7	33.4	5.46	6.8
Lansdale				2.94	
Lawrenceville	52	−10	28.0	1.16	5.0
Lebanon	47	5	30.9	3.75	14.8
Leroy †	50	4	25.8	2.28	10.3
Lewisburg	47	−5	29.8	2.54	11.0
Lock Haven *a* †	56	−2	32.2	3.52	12.0
Lock Haven *b*				2.67	11.0
Lock No. 4 †				3.62	
Lycippus	56	2	31.4	4.70	8.5
Mifflin				3.70	7.0
Oil City †				2.91	2.4
Ottsville				3.03	
Parker †				3.64	6.0
Philadelphia *b*	56	15	35.4	3.64	5.4
Point Pleasant				3.06	
Pottstown	50	8	33.1	5.07	12.0
Quakertown	53	0	30.0	3.84	16.0
Reading [2]			30.8	2.94	
Renovo *a*				2.31	8.5
Renovo *b*	55	−1	30.6	2.41	12.0
Ridgway †				2.13	
Saegerstown	49	−14	27.2	2.41	7.0
St. Marys	48	5	26.9		
Salem Corners	45	7	28.0	3.69	15.5
Scranton	47	3	29.8	2.73	9.0
Seisholtzville				2.73	
Selinsgrove	51	−2	31.4	3.26	9.5
Shawmont				3.18	7.9
Shinglehouse	50	−10	26.3	1.44	4.7
Sinnamahoning				1.01	
Skippack	55	1	32.4	4.20	8.8
Smethport	48	−8	26.4	2.75	8.5
Smiths Corners				2.60	
Somerset	52	4	28.4	6.67	19.8
South Bethlehem	52	16	35.2		11.0
South Eaton	49	−1	29.0	2.49	10.0
State College	54	3	29.2	3.19	13.3
Sunbury				2.20	
Swarthmore	52	10	33.6	2.91	7.5
Swiftwater	48	1	27.2	2.83	11.0
Towanda	52	−3	28.6	1.56	7.0
Uniontown	60	10	35.4	5.73	
Warren †	46	0	28.2	1.53	4.0
Wellsboro †	56	−8	27.8	2.30	6.5
West Chester	52	11	32.4	5.00	11.5
West Newton †				4.63	
Westtown	51	7	31.7	4.52	8.2
White Haven	46	−7	26.3	1.73	8.5
Wilkesbarre †	51	6	31.9	2.06	10.0
Williamsport	49	5	30.6	2.99	13.0
York †	49	3	30.5	4.59	18.9
Rhode Island.					
Bristol	43	12	30.4	2.49	10.2
Kingston	48	9	28.4	2.73	12.0
Providence *a*	50	13	31.0	3.00	17.5
South Carolina.					
Anderson †				6.81	
Batesburg †	76	24	49.0		
Blackville †	78	24	51.8	7.82	
Camden †				8.18	
Central †	75	17	45.6		T.
Cheraw *a* †	79	21	47.6	6.30	
Cheraw *b* †				7.74	
Clemson College	76	16	46.0	6.63	
Conway †				8.70	
Darlington (near)				8.14	
Edisto †				8.09	
Effingham †				7.02	
Florence †	78	23	49.4	7.84	
Georgetown †	79	29	52.4	10.50	
Gillisonville †	83	25	55.4	9.14	
Greenville †	74	20	44.8	7.85	T.
Greenwood				7.56	
Holland	75	16	43.9	6.63	1.0
Kingstree *a* †	80	25	51.6	7.24	
Kingstree *b* †				7.24	
Little Mountain	77	25	51.0	7.65	
Longshore †	75	24	48.5	8.37	
Mount Carmel †				7.93	
Pinopolis *[1]	75	32	53.4	9.08	
Port Royal †	74	35	54.9	7.54	
South Dakota.					
Aberdeen †	31	−25	9.1	2.39	9.7
Alexandria †	38	−25	13.2	0.72	7.5
Armour †	42	−22	16.6	1.14	9.0
Ashcroft †	49	−24	20.6	0.50	5.0
Brookings	36	−27	14.4	0.30	3.0
Castlewood †	35	−32	11.4	0.40	4.0
Chamberlain †	44	−17	16.6	0.24	2.8
Cross †	47	−9	23.1	0.29	5.3
Doland	38	−28	11.8	0.52	3.3
Edgemont				0.14	
Flandreau †	42	−27	14.4	0.55	5.5
Forestburg †	40	−26	13.9	1.10	11.0
Fort Meade †		−7		0.05	
Greenwood †	49	−13	23.1	0.43	2.9
Highmore	38	−25	10.0	0.80	8.0
Hotch City †	39	−23	14.0	0.41	3.0
Hot Springs	45	3	25.8	0.17	2.6
Howard †	37	−27	13.8	1.10	11.0
Kimball †	37	−22	14.6	1.20	11.5
Leslie †	46	−22	17.0	0.15	
Mellette †	38	−28	7.9	0.97	9.8
Menno †	41	−18	18.0	0.28	2.9
Mitchell †	40	−25	14.0	0.47	4.0
Oelrichs †	48	−3	24.6	0.69	6.0
Parker †	40	−23	16.8	0.60	6.0
Parkston	46	−19	17.4	0.90	3.0
Plankinton †	40	−21	13.2	1.05	9.0
Rosebud	50	−15	23.1	1.12	9.0
Silver City				0.33	3.3
Sioux Falls †	42	−23	16.0	0.80	8.0
Spearfish †	48	−1	25.6	0.80	6.0
Tyndall †	52	−15	22.9	0.30	3.0
Vermillion	48	−20	20.2	0.45	4.5
Webster †	33	−27	14.2	5.55	35.5
Wentworth †	37	−26	13.2	0.68	6.8
Tennessee.					
Andersonville *[1]	72	16	42.6	6.53	T.
Ashwood *† [1]	73	15	46.9	4.30	T.
Bayne *[1]	74	20	43.4	2.55	T.
Benton (near) †	77	16	47.4	4.72	
Bluff City †				6.51	
Bolivar †	72	14	44.5	3.00	T.
Bristol †	71	15	41.0	9.20	0.2
Byrdstown	73	13	43.0	6.55	0.3
Cagle *[1]	70	12	43.2		
Carthage †				5.91	
Charleston †				6.00	
Charlotte	75	12	43.6	4.22	T.
Clarksville	75	15	43.0	4.06	0.3
Clinton †				7.42	
Decatur †	74	16	46.0	5.62	T.
Dyersburg	74[c]	29[c]	46.2[c]	3.13	T.
Elizabethton †	72	16	42.6	6.63	2.2
Elk Valley *[1]	73	16	43.6	5.65	T.
Erasmus	73	10	42.0	5.73	0.5
Fairmount	66[c]	22	43.3	6.23	0.2
Florence †	74	15	45.0	5.12	T.
Franklin	76	13	44.6	5.40	T.
Greeneville †	72	15	43.3	4.68	4.5
Harriman	76	16	44.8	7.23	T.
Hickory Withe	75	19	46.2	4.69	T.
Hohenwald †	76	9	45.4	5.00	T.
Jackson †	75	15	46.0	3.42	T.
Johnsonville †	75	13	45.6	2.96	T.
Jonesboro *† [1]	68	20	41.5	6.46	1.2
Kingston †				6.65	T.
Liberty †	75	20	45.8	5.06	T.
Loudon †				5.05	
Lynnville *† [1]	75	17	44.2	4.26	T.
McKenzie †	74	13	43.4	4.50	T.
McMinnville †	75	16	46.2	6.03	T.
Molino †	74	15	46.2	5.05	
Newport †	79	16	45.0	4.12	T.
Nunnelly *[1]	74	13	45.1	3.83	T.
Oak Hill *[1]	74	14	43.2		
Palmetto †	76	15	47.6	3.85	T.
Pope	76	14	46.1	1.02	
Riddleton †	73	17	44.2	4.56	0.5
Rockwood †				7.29	
Rogersville †	71	17	43.3	6.80	T.

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Tennessee—Cont'd.	°	°	°	*Ins.*	*Ins.*
Rugby	75	10	42.0	7.03	1.0
St. Joseph†	75	13	47.4	3.66	
Savannah	76	15	48.8	2.84	T.
Sewanee†	69	10	43.6	7.15	
Springdale*[1]	72	18	45.3	6.44	T.
Strawberry Plains†				4.96	
Tellico Plains†	76	17	47.0	4.75	T.
Trenton	74	14	42.0	4.13	T.
Tullahoma†	72	13	44.0	4.35	T.
Union City†	75	12	42.8	5.09	T.
Waynesboro	74	12	45.7	4.17	
Texas.					
Albany*[1]	73	21	46.6	T.	
Arthur City†				0.26	
Austin *a*		30		0.40	
Austin *b*[5]	78	26	53.7		
Ballinger†	85	27	51.3	0.01	
Beeville†	86	29	60.5	0.05	
Blanco†	82	28	54.0	0.00	
Boerne*†[1]	83	30	55.0	0.10	
Bowie	82	25	48.0	0.34	
Brady	89	18	53.2	0.09	
Brazoria†	80	31	58.5	1.42	
Brenham†	81	31	57.3	0.50	
Brighton†		29		0.00	
Brownwood*[5]	84	24	51.7	0.05	
Burnet*[1]	86	25	54.6	0.00	
Camp Eagle Pass†	96	30	62.9	0.00	
Childress[1]	78*	21	43.2	1.03	T.
Coleman				0.00	
College Station	78	29	55.0	0.15	
Colmesneil				0.37	
Columbia†	82	31	56.9	2.33	
Corsicana *b*†	85	15	53.4	0.27	
Cuero†	82	31	58.9	0.18	
Dallas†	85	23	48.7	0.01	
Danevang†	82	31	57.9	1.51	
Dean	70	19	38.2	0.25	1.8
Dublin†	82	24	48.2	T.	
Duval*[1]	84	30	59.0	0.76	
Estelle†	85	19	49.6	0.15	
Forestburg†	88	19	50.1	0.47	
Fort Clark	89	27	56.6	0.00	
Fort McIntosh	88	30	61.4	0.00	
Fort Ringgold†	94	32	64.3	0.00	
Fort Stockton				0.08	
Fort Worth†	86°	24°	50.4°	0.03	
Fredericksburg*†[1]	84°	27	53.8°	0.05	
Gail				0.50	
Gainesville†	81	25	49.0	1.12	
Georgetown*[1]	78°	27	52.7°	0.40	
Golindo				0.85	
Graham	83	19	48.2	0.24	
Grapevine†	85	25	49.2	0.01	
Hale Center†	79	22	47.8	T.	T.
Hallettsville†	81	30	59.4	0.03	
Hewitt				1.45	
Houston†	80	31	56.1	1.78	
Huntsville†				0.18	
Junction City				0.03	
Kent				0.00	
Kerrville†	87	26	51.0	T.	
Lampasas†	90	21	54.6	0.18	
Llano*†[5]	88	30	55.6	T.	
Longview†	83	28	52.7	0.30	
Luling†	83	29	58.8	0.16	
Mann				1.30	
Marathon	87	21	51.8	0.00	
Moore Station	86	34	60.4		
Mount Blanco†	78	15	44.4	1.00	T.
New Braunfels†	81	28	57.6	0.14	
Orange†	72	31	52.3	2.40	
Panter*†[1]	83°	28°	55.0°	0.15	
Paris†	84	22	50.0	0.66	
Point Isabel*[1]	82	54	66.8	0.00	
Rheinland†	81	22	50.2	0.52	
Roby†	83	11	46.6	0.20	
Sanderson†	84	23	52.7	0.00	
San Marcos *b*†	82	25	55.8	0.25	
Sierra Blanca†	76	20	47.8	0.00	
Stafford†	80	30	58.0	1.39	
Sulphur Springs†	85	23	52.6	0.26	
Temple *a*	82	29	53.4	0.88	
Tulia	76	15	42.6	T.	
Tyler		28		1.50	
Waco†	83	30	53.0	0.95	
Weatherford†	82	23	47.7	0.16	
Wichita Falls†				0.42	
Utah.					
Alpine City†				3.50	
Blue Creek*[5]	40	5	27.9		7.5
Brigham City†				3.55	
Cisco†	48	−4	27.9	1.85	18.5
Corinne	54	1	29.6	1.78	14.0
Farmington				1.83	16.5
Fillmore†	63	−4	30.8	2.17	
Utah—Cont'd.	°	°	°	*Ins.*	*Ins.*
Fort Duchesne†	43	−15	15.5	0.90	9.0
Frisco	51	6	31.4	0.30	3.0
Giles†	50	−4	25.5	0.89	15.0
Grover†	49	−17	21.0	1.60	16.0
Heber	48	−14	23.3	4.10	41.0
Huntsville†				5.94	29.0
Kelton*[5]	48	0	25.4		4.5
Kooskarem	48	−15	21.8		
Levan†	50	−1	28.2	1.88	11.7
Loa†	49	−21	21.2	1.80	18.0
Logan†	42	4°	26.5	2.33	
Mammoth†	46	−1	25.8	5.90	59.0
Manti†	54	−12	25.4	2.40	24.0
Millville†				2.51	
Minersville	54	0	30.2	1.75	15.5
Moab†	47	12	32.3	2.12	10.0
Mount Pleasant*†[1]	50	2	27.0	3.10	31.0
Ogden *a*[5]	47	20	33.9	2.85	15.5
Park City†	49	−8	27.8	5.39	55.0
Parowan†	57	−7	28.6	3.45	34.5
Pinto				3.05	15.0
Promontory	44	15	32.4	1.30	13.0
Provo	61	6	31.8		
Richfield†	53	−8	28.2	1.85	13.5
St. George†	61	10	36.6	2.35	5.0
Scipio†	53	−9	28.0	2.61	18.5
Snowville†	40	−3	25.7	0.95	9.0
Soldier Summit†	41	−12	18.0	2.80	28.0
Terrace*[5]	40	3	21.1	0.65	4.2
Thistle†	40	−5	24.1	2.05	20.5
Tooele†	54	11	32.2	1.95	
Tropic	50	1	28.2		
Vernal	45	−2	24.7	1.11	11.1
Woodruff	36	−10	17.0	1.70	17.0
Vermont.					
Bennington	44	−6	23.6	2.14	10.0
Brattleboro	47	−11	24.3	1.99	20.5
Burlington†	42	0	22.6	1.08	9.0
Chelsea†	43	−9	20.4	1.90	21.0
Cornwall	47	−5	20.4	1.04	9.0
Enosburg Falls	48	−15	18.6	1.25	11.5
Hartland†	46	−19	19.1	2.09	17.2
Jacksonville	42	−21	21.0	4.50	23.2
St. Johnsbury	44	−16	18.6	1.80	23.0
Strafford*†[1]	38	−2	20.8	1.95	20.0
Vernon*[6]	45	−12	23.2	2.18	17.5
Wells	43	−4	22.0	1.55	10.0
Woodstock	45	−22	20.5	2.09	15.0
Virginia.					
Alexandria	63	16	36.5	5.23	2.5
Ashland†	68	15	40.9	6.26	3.0
Barboursville	61	8	36.3	5.56	5.0
Bedford City*	73	16	40.4		
Bigstone Gap†	71	10	39.8	8.25	1.0
Birdsnest*†[1]	70	24	40.7	5.00	0.5
Blacksburg	65	9	36.8	6.93	5.8
Buckingham†	69	−2	37.9	6.70	T.
Burkes Garden	61	9	34.0	7.74	3.5
Callaville†	71	18	42.4	6.38	
Christiansburg†				6.80	0.3
Clifton Forge	61	10	34.2	5.19	4.5
Dale Enterprise†	60	3	33.9	5.64	13.9
Doswell	62	20	39.5		1.0
Farmville[4]	70	20	47.8		1.5
Fredericksburg†	64	10	38.0	6.40	3.0
Gordonsville	53	23	38.9		1.0
Goshen	61	14	39.4		5.0
Grahams Forge	69	14	38.4	9.19	4.0
Guinea	63	23	38.8	2.68	1.1
Hampton	66	26	43.1	4.94	T.
Hot Springs	58	12	33.0	6.96	10.6
Lexington†	66	9	38.2	5.79	7.5
Maidens	61	23	40.4	5.91	T.
Manassas†	63	10	37.0	6.49	7.5
Marion†[6]	65	14	38.6	9.71	4.0
Monterey	52	6	32.4	5.21	19.0
Petersburg†	73	21	43.0	5.85	1.0
Quantico	61	18	35.9		2.0
Radford†				6.17	1.0
Richmond				4.35	
Richmond (near)†	72	16	42.6	6.27	1.9
Rockymount†	71	20	42.9	9.25	T.
Salem†	74	20	43.1	7.56	1.5
Saltville	69	16	40.6	6.47	T.
Smithville†	68	20	41.2	4.72	
Speers Ferry†				9.48	T.
Spottsville†	71	18	40.9	6.82	1.2
Stanardsville†	61	12	36.8	5.08	3.0
Stanleyton	64	10	35.2	7.73	13.5
Staunton†	64	11	37.7	3.99	11.0
Stephens City†	62	10	35.0	6.89	11.7
Sunbeam†	64	23	40.6	5.60	
Swords Creek	74	11	43.6	7.33	0.0
Warsaw†	63	15	38.6	6.26	3.0
Westbrook Farm	68	17	41.2		
Woodstock†	67	10	35.3	7.65	11.5
Virginia—Cont'd.	°	°	°	*Ins.*	*Ins.*
Wytheville	65	12	37.0	9.37	7.5
Washington.					
Ashford†				7.91	18.0
Blaine†	50	20	36.7	4.72	0.2
Cascade Tunnel	43	10	28.4	11.20	112.0
Centerville†	54	15	35.8	2.77	6.2
Chehalis†	57	30	41.8	6.03	6.5
Colfax†	52	20	34.6	3.45	11.1
Coupeville†	53	28	41.2	1.82	T.
Dayton	54	25	38.0	2.32	
Ellensburg†	46	0	29.9	1.93	
Ellensburg (near)	40	4	29.0	1.55	11.0
Elma	70	29	43.6	3.75	2.0
Fort Simcoe†	56	22	36.8	1.76	1.9
Fort Spokane	45	10	30.7	1.78	11.0
Grandmound†	53	26	40.6	6.78	5.0
Hunters†	41	0	24.9	1.78	19.7
Kennewick†	60	19	39.8	1.00	
La Center	59	29	41.3	9.77	3.4
Lakeside	44	8	30.2	2.80	19.0
Lapush†	56	28	41.5	9.75	0.2
Loomis†	43	8	29.5	0.85	2.0
Madrone*†[1]	54	27	41.1	3.35	2.0
Mayfield †	57°	28°	43.1°	9.46	
Moxee Valley†	59	17	38.6	0.85	T.
New Whatcom†	55	28	42.0	2.70	
Northbend	55	25	40.8	10.05	3.0
Olga	52	30	41.7	2.58	T.
Olympia†	54	29	41.6	6.58	T.
Pinehill†	52	22	37.9	4.97	7.2
Pomeroy†	56	28	38.8	2.83	16.0
Pullman†	51	18	37.8	3.05	12.0
Rosalia†	47	10	31.6	2.32	14.1
Sedro†	61	27	41.7	4.48	T.
Silvercreek*[1]	55	28	38.4	8.64	7.2
Snohomish†	59	27	42.0	3.69	1.0
Southbend	64	30	43.2	10.30	
Stampede	44	14	30.7	9.30	92.0
Stillaguamish	54	25	39.6	5.15	0.2
Sunnyside†	58	17	35.7	0.88	1.5
Tacoma†	55	28	40.0	5.19	0.8
Union City†	60	28	41.1	7.83	
Vashon†	52	31	41.6	5.51	
Waterville†	50	−5	34.2	2.70	23.5
Wenatchee Lake	42	−2	27.5		53.0
West Virginia.					
Beckley	60	8	32.7	4.94	1.0
Beverly†	70	4	37.8	8.23	13.0
Bloomery†	60	6	30.4	5.41	15.2
Bluefield†	67	12	38.2	6.28	6.3
Buckhannon *a*†				6.10	4.0
Buckhannon *b*	70	5	36.2		
Burlington†	65	7	34.4	6.43	10.0
Charleston†				5.90	5.0
Dayton†				4.65	
Elkhorn†	70	15	41.9	6.74	1.5
Fairmont†				5.47	1.3
Glenville†	65	11	35.8	7.49	T.
Grafton†	65	8	35.4	5.27	3.6
Green Sulphur	63	16	37.2	7.21	
Harpers Ferry†				5.76	2.0
Hewett†	68	16	40.9	7.17	1.8
Hinton *a*†				7.08	5.0
Hinton *b*†	66	15	39.6		
Huntington	66	3	37.8		
Kingwood	64	5	34.7	5.94	
Marlinton†	59	3	33.2	5.88	13.5
Martinsburg†	55	11	34.6	4.90	12.5
Morgantown *a*†				4.90	
Morgantown *b*†	65	−8	36.5	3.94	0.1
New Martinsville†	66	12	37.6	5.91	
Nuttallburg†	67	4°	37.3°	6.80	
Oldfields†	65	6	34.8	7.60	19.8
Pennsboro	66	10	37.4	5.85	2.0
Philippi†	70	10	37.8	7.29	1.0
Point Pleasant†	68	13	38.8	8.18	2.0
Powellton†	67	10	41.4	4.61	3.2
Romney	63	9	36.2	6.03	13.0
Rowlesburg†				5.08	2.0
Tannery*[1]	60	12	34.0		5.5
Weston *a*†				6.40	3.0
Weston *b**[1]	66	10	38.2		
Wheeling *a*†				3.00	1.4
Wheeling *b*†	58	12	37.6	3.85	1.0
White Sulphur Springs†	63	7	36.2	7.07	7.0
Wisconsin.					
Amherst	37	−18	19.7	2.20	22.0
Apollonia*†[1]	40	−22	20.4	1.40	14.0
Barron	42	−25	18.2	1.75	17.5
Bayfield	36	−17	18.2	0.80	8.0
Beloit	39	−6	26.2	0.47	6.7
Boscobel†				1.40	14.0
Butternut	40	−29	17.4	0.88	8.9
Chilton	39	−13	22.8	0.68	
Citypoint	39	−21	19.4	1.43	14.2
Crandon†	45	−25	16.6	1.52	15.2

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Wisconsin—Cont'd.	°	°	°	*Ins.*	*Ins.*
Dodgeville†	40	−16	23.3	0.78	8.9
Easton†	38	−17	20.8	0.58	10.8
Eau Claire	44	−18	19.2	2.75	18.0
Florence†	40	−26	17.4	1.15	19.5
Fond du Lac	40	−10	23.4	0.89	8.1
Grand River Lock	.....	.....	.....	0.73	10.0
Grantsburg†	39	−34	16.8	1.28	12.8
Gratiot†	45	−14	24.8	1.00	10.0
Hartford	.....	.....	.....	2.06	11.0
Hartland	38	− 9	24.4	1.42	13.3
Harvey	40	− 7	25.4	1.53	12.7
Hayward†	36	−35	15.8	2.28	22.8
Hillsboro	41	−12	22.2	1.25	12.0
Hudson	.....	.....	.....	0.46	6.0
Koepenick *†[1]	36	−14	19.8	1.20	11.0
Lancaster†	39	−18	21.6	0.45	7.2
Lincoln†[2]	.....	.....	23.6	1.75	17.5
Madison†	39	−11	23.6	0.82	7.4
Manitowoc†	39	− 9	25.4	1.11	10.4
Meadow Valley†	38	−23	20.0	1.18	10.0
Medford†	40	−22	18.5	0.66	6.6
Menasha	.....	.....	.....	0.82	9.8
Neillsville†	38	−29	19.8	1.38	11.0
New Holstein	40	−10	23.0	0.90	9.0
New London	47	−17	22.8	1.15	25.0
Oconto	40	−11	24.0	1.30	13.0
Osceola†	39	−28	18.1	0.73	11.2
Oshkosh†	37	−11	22.0	1.11	11.1
Pepin	44	−20	19.2	0.90	12.0
Pine River†	39	−17	22.2	0.87	13.3
Portage†	39	−14	22.3	0.64	10.0
Port Washington	41	−11	26.5	1.20	4.0
Prairie du Chien	59	−11	27.9	1.11	9.2
Racine	42	− 5	28.4	0.84	10.5
Sharon†	46	−12	23.8	1.55	13.0
Shawano	39	−12	23.1	1.53	11.8
Spooner†	35	−27	16.8	0.70	7.0
Stevens Point†	36	−30	20.6	0.91	10.0
Sturgeon Bay Canal *[9]	38	−12	23.2	.....	.....
Valley Junction†	40	−17	20.9	1.06	11.2
Viroqua	38	−15	22.7	1.27	7.5
Watertown†	42	−13	25.4	1.35	12.5
Waukesha†	39	− 8	26.1	1.03	10.6
Waupaca†	37	−14	21.2	0.95	16.5
Wausau†	36	−16	20.5	1.24	12.0
Wausaukee	44	−22	20.8	1.08	9.5
Westbend	40	− 6	26.8	1.23	11.3
Westfield†	39	−15	22.7	0.90	8.0
Whitehall	39	−20	19.0	0.94	9.5
White Mound†	45	−15	23.8	0.70	7.0
Wyoming.					
Big Horn Ranch	46	−11	20.4	0.79	7.9
Fort Laramie†	54	5	30.5	0.38	3.0
Fort Washakie†	51	− 5	22.5	0.67	6.7
Fort Yellowstone†	40	−10	20.5	0.83	8.3
Laramie	47	− 4	19.4	0.35	.....
Lusk†	47	2	23.1	T.	T.
Sheridan	45	−12	18.8	0.75	7.5
Sundance	40	− 9	19.2	2.30	23.0
Mexico.					
Ciudad P. Diaz	88	30	61.3	0.02	
Jalapa	93	41	65.0	0.73	
Leon de Aldamas	84	35	60.4	T.	
Mexico	81	39	60.4	0.00	
Puebla	83	39	61.5	0.00	
Topolobampo *[1]	81	58	67.0	0.00	
New Brunswick.					
St. John	41	− 1	21.2	2.18	10.7
West Indies.					
Grand Turk Island	.....	.....	.....	0.00	

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Alabama.					
Birmingham	71	10	43.0	4.35	
Alaska.					
Coal Harbor	42	5	31.2	4.90	11.5
Killisnoo	42	6	28.6	5.45	6.0
California.					
Campbell	61	30	46.5	2.38	
Edmanton *[1]	56	15	34.2	5.44	18.0
Picacho	76	40	56.9	1.90	
San Miguel Island	69	37	52.6	4.28	
Upper Lake	65	27	43.2	3.45	
Colorado.					
Holyoke *b*	.....	.....	.....	0.30	3.0
Illinois.					
East Peoria	.....	.....	.....	3.47	8.3
Rushville	66	−14	24.0	5.93	8.8
Indiana.					
Rushville	.....	.....	.....	2.80	7.7
Indian Territory.					
Eufaula	.....	.....	.....	0.98	4.5
Kansas.					
Hays	65	− 6	37.5	0.20	2.0
Louisiana.					
Hammond	72	17	47.9	5.27	
Houma	79	19	50.0	4.12	
Jeanerette	77	19	52.0	7.17	
Lake Providence	61	11	42.5	4.13	2.6
Lawrence	76	24	50.9	1.88	
Minden	74	10	44.0	6.06	
Rayne	73	19	49.0	6.98	
Schriever	79	18	50.7	4.80	
Shellbeach	72	21	50.5	4.60	
Michigan.					
Thunder Bay Island *[10]	40	− 4	21.4	.....	.....
Nebraska.					
Ashland *b*	50	−11	21.8	0.36	.....
Hayes Center	.....	.....	.....	0.20	2.0
New Mexico.					
Bernalillo	.....	.....	.....	0.28	3.0
Olio	50	5	30.2	.....	.....
New York.					
North Lake	50	−20	17.1	5.50	53.0
Ohio.					
Portsmouth *a*	.....	.....	.....	2.93	3.0
Oregon.					
Tillamook Rock L. H	.....	.....	.....	5.49	
Texas.					
Austin *a*	67	17	42.8	5.50	
Temple	74	10	43.2	3.35	
Washington.					
Wenatchee Lake	38	−11	20.9	.....	.....
Mexico.					
Jalapa	88	41	58.0	2.90	
Puebla	76	40	58.3	0.04	

EXPLANATION OF SIGNS.

* Extremes of temperature from observed readings of dry thermometer.

† Weather Bureau instruments.

‡ Record furnished by the Arrowhead Reservoir Company, in the San Bernardino Mountains, San Bernardino County, Cal., at elevations varying from 4,900 to 6,900 feet.

A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:

[1] Mean of 7 a. m. + 2 p. m. + 9 p. m. + 9 p. m. ÷ 4.
[2] Mean of 8 a. m. + 8 p. m. ÷ 2.
[3] Mean of 7 a. m. + 7 p. m. ÷ 2.
[4] Mean of 6 a. m. + 6 p. m. ÷ 2.
[5] Mean of 7 a. m. + 2 p. m. ÷ 2.
[6] Mean of readings at various hours reduced to true daily mean by special tables.
[7] Mean from hourly readings of thermograph.
[8] Mean of 7 a. m. + 2 p. m. + 9 p. m. ÷ 3.
[9] Mean of sunrise and noon.
[10] Mean of sunrise, noon, sunset, and midnight.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

An italic letter following the name of a station, as "Livingston *a*," "Livingston *b*," indicates that two or more observers, as the case may be, are reporting from the same station. A small roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance, "[s]" denotes 14 days missing.

No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks, of whatever duration, in the precipitation record receive appropriate notice.

CORRECTIONS.

January, 1897, REVIEW, page 24, make heading of table read January, 1897, instead of January, 1896.

Arkansas, Rison, January, 1897, make precipitation read 7.62 instead of 5.62.

NOTE.—The following change has been made in the names of stations: Missouri, Cedargap, changed to Seymour.

§ Reports from New Mexico not received.

TABLE III.—*Data from Canadian stations for the month of February*, 1897.

Stations.	Pressure. Mean not reduced.	Mean reduced.	Departure from normal.	Temperature. Mean.	Departure from normal.	Precipitation. Total.	Departure from normal.	Prevailing direction of wind.	Total depth of snow.
	Inches.	*Inches.*	*Inches.*	°	°	*Inches*	*Inches.*		
St. Johns, N. F	29.58	29.73	− .19	19.8	− 2.4	5.85	.....	ne.	58.5
Sydney, C. B. I	29.88	29.94	− .01	17.7	− 0.8	3.23	− 0.96	nw.	29.5
Grindstone, G. St. L.	.....	.....	.....	.....	.....	.....	.....	.....	.....
Halifax, N. S	29.88	30.02	+ .04	23.2	+ 2.2	2.89	− 1.81	nw.	21.5
Grand Manan, N. B.	29.98	30.03	+ .05	25.2	.....	1.30	− 2.26	w.	4.7
Yarmouth, N. S.	29.92	30.00	− .04	25.6	+ 1.1	2.28	− 3.54	nw.	17.7
St. Andrews, N. B.	.....	.....	.....	21.6	+ 1.0	1.62	− 2.14	nw.	11.2
Charlottet'n, P. E. I.	29.93	29.97	+ .05	16.4	− 1.1	1.62	− 2.08	nw.	16.2
Chatham, N. B	29.98	30.00	+ .02	11.2	+ 1.7	1.63	− 1.68	w.	16.3
Father Point, Que.	30.01	30.04	+ .04	12.3	+ 2.3	0.97	− 0.65	nw.	9.7
Quebec, Que	29.72	30.07	+ .03	14.9	+ 4.9	2.02	− 1.37	w.	17.7
Montreal, Que	29.86	30.08	+ .03	17.4	+ 4.4	2.13	− 0.69	sw.	16.5
Rockliffe, Ont	29.52	30.07	+ .01	9.8	+ 3.3	1.70	− 0.62	se.	17.0
Kingston, Ont	29.75	30.09	+ .01	19.4	+ 2.9	2.16	− 0.28	ne.	7.7
Toronto, Ont	29.68	30.09	.00	24.2	+ 3.7	2.34	+ 0.03	n.	12.3
White River, Ont	28.67	30.14	+ .06	2.0	+ 3.5	0.92	− 0.30	e.	9.2
Port Stanley, Ont'.	29.40	30.08	− .01	25.0	.....	2.77	− 0.15	w.	12.4
Saugeen, Ont	29.52	30.08	+ .02	21.7	+ 4.2	2.29	− 0.15	w.	19.0

TABLE III.—*Data from Canadian stations*—Continued.

Stations.	Pressure. Mean not reduced.	Mean reduced.	Departure from normal.	Temperature. Mean.	Departure from normal.	Precipitation. Total.	Departure from normal.	Prevailing direction of wind.	Total depth of snow.
	Inches.	*Inches.*	*Inches.*	°	°	*Inches*	*Inches.*		
Parry Sound, Ont	29.32	30.05	− .02	17.2	+ 5.2	2.74	+ 0.34	w.	22.8
Port Arthur, Ont	29.30	30.05	− .04	11.4	+ 5.9	0.92	− 0.41	ne.	9.2
Winnipeg, Man	29.19	30.10	− .06	− 0.3	+ 4.7	0.89	− 0.28	se.	8.9
Minnedosa, Man	28.12	30.10	− .05	− 1.3	+ 4.7	0.43	− 0.55	nw.	4.3
Qu'Appelle, Assin.	27.62	30.07	− .07	1.1	+ 3.6	0.75	+ 0.08	s.	7.5
Medicine Hat, Assin	27.55	30.02	− .12	10.3	− 0.2	0.41	− 0.03	s.	4.1
Swift Curr't, Assin.	27.28	30.05	− .09	8.5	+ 2.5	0.84	+ 0.08	w.	8.4
Calgary, Alberta	26.28	30.02	− .07	14.6	+ 5.1	0.46	− 0.30	w.	4.6
Prince Albert, Sask.	.....	.....	.....	− 2.4	.....	0.64	.....	e.	6.4
Edmonton, Alberta	27.54	30.04	− .05	10.2	+ 3.6	0.32	− 0.14	nw.	3.2
Battleford, Sask	28.20	30.10	.....	− 1.6	.....	0.60	.....	se.	6.0
Kamloops, B. C.	28.67	29.96	.....	29.2	.....	0.07	.....	e.	....
Hamilton, Bermuda	.....	.....	.....	.....	.....	.....	.....	.....	.....
Banff, Alberta	25.13	30.00	... .	15.0	.....	0.27	.....	sw.	0.7
Esquimalt, B. C.	29.88	29.91	... .	40.0	.....	3.98	....	n.	....
Ottawa, Ont	29.74	30.12	.....	15.7	... .	1.92	.....	e.	....
January, 1897.									
Hamilton, Bermuda	29.90	30.06	− .07	61.9	.....	5.00	.....	nw.	0.0

TABLE V.—*Mean temperature for each hour of seventy-fifth meridian time, February, 1897.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Bismarck, N Dak.....	4.4	3.4	2.6	2.7	2.4	1.6	2.0	2.1	1.6	2.8	4.8	6.5	7.8	10.0	11.8	13.3	13.9	13.7	12.5	10.3	8.8	7.9	6.6	5.4	6.6
Boston, Mass.	29.2	28.5	28.1	27.6	27.3	27.1	26.8	27.4	28.8	30.1	31.7	33.3	34.7	35.6	36.0	35.8	34.8	33.5	32.6	31.9	31.5	30.9	29.8	29.2	30.9
Buffalo N Y.....	26.1	26.2	26.3	26.0	26.0	26.2	26.2	26.5	27.1	27.5	28.1	28.5	29.1	29.5	29.7	29.4	28.7	28.0	27.7	27.2	27.2	26.6	26.2	25.5	27.3
Chicago, Ill.....	28.1	27.7	27.2	26.8	26.5	26.1	26.0	26.5	26.2	26.9	28.0	29.0	29.7	30.3	30.9	31.1	31.2	31.0	30.6	30.2	29.7	29.2	28.7	28.2	28.6
Cincinnati, Ohio.....	34.7	34.0	33.6	33.0	32.5	32.1	32.1	32.7	32.8	33.8	35.4	37.1	38.4	38.8	39.4	40.1	40.4	40.0	39.2	38.6	37.3	36.6	36.0	35.4	36.0
Cleveland, Ohio*.....																									
Detroit, Mich.....	26.3	25.9	25.9	25.7	25.5	25.4	25.1	25.0	25.5	26.3	27.3	28.6	29.2	29.7	30.1	30.3	30.1	29.6	28.6	28.2	27.5	27.0	26.7	26.5	27.3
Dodge City, Kans.....	30.9	30.2	29.6	28.6	27.8	27.3	27.0	26.1	25.6	25.4	28.8	31.8	34.9	36.8	38.6	40.0	41.0	41.1	39.9	36.3	35.0	33.8	32.7	31.8	32.6
Eastport, Me.....	22.8	22.2	21.9	21.4	21.2	20.9	20.7	20.8	21.7	22.7	24.1	25.3	26.4	27.2	28.0	28.1	27.4	26.7	25.8	25.1	24.3	23.5	22.9	22.6	23.9
Galveston, Tex.....	55.6	55.5	55.0	54.6	54.1	53.9	53.4	53.6	53.4	54.8	55.9	57.4	58.4	59.2	59.4	59.6	59.8	59.5	58.5	57.9	57.4	57.2	56.7	56.6	56.5
Havre, Mont.....	9.9	8.7	7.4	7.0	8.1	7.5	6.8	6.5	6.2	5.9	6.8	8.7	11.2	12.9	14.6	16.5	17.1	17.0	16.1	16.4	14.8	13.4	11.7	10.5	10.9
Kansas City, Mo.....	31.8	31.2	30.9	30.5	29.9	29.7	29.4	29.9	29.8	30.4	31.5	32.6	33.6	34.7	35.4	36.2	36.4	36.4	35.8	34.9	34.1	33.4	32.8	32.4	32.6
Key West, Fla.....	70.2	70.1	70.1	70.2	70.2	70.4	70.6	71.1	72.8	73.9	74.5	75.1	75.4	75.3	75.5	75.2	74.7	73.7	72.9	72.2	71.9	71.1	70.8	70.4	72.4
Memphis, Tenn.†.....																									
New Orleans, La.....	55.8	55.1	54.8	54.5	54.0	53.8	53.5	53.1	53.3	54.4	56.4	58.8	60.5	61.8	62.4	63.1	62.6	62.4	60.8	59.3	58.2	57.5	56.9	56.4	57.5
New York, N. Y.....	30.8	30.2	29.9	29.8	29.5	29.0	28.6	29.0	29.8	30.5	32.0	33.3	34.4	34.9	35.5	35.5	34.6	34.1	33.3	33.4	32.6	32.2	31.8	31.0	31.9
Philadelphia, Pa.....	33.4	33.0	32.5	32.0	31.8	31.8	31.9	32.4	33.4	35.0	36.0	37.4	38.1	38.6	39.0	39.1	38.5	37.3	36.4	36.2	35.4	34.9	34.2	33.9	35.1
Pittsburg, Pa.....	32.4	31.8	31.4	31.1	30.8	30.8	31.4	32.0	32.7	33.5	34.9	35.9	37.1	37.8	38.4	38.4	38.2	37.5	36.7	36.2	35.2	34.3	34.0	33.4	34.4
Portland, Oreg.....	41.9	41.3	40.7	40.1	40.0	39.8	39.8	39.9	39.7	36.9	39.4	40.1	41.0	42.4	43.3	44.2	44.7	44.9	45.2	44.8	44.4	43.5	42.9	42.6	41.9
St. Louis, Mo.....	34.5	33.8	33.2	32.9	32.4	32.1	32.0	32.1	31.9	33.0	34.3	36.2	37.9	39.5	40.7	41.2	41.4	40.4	39.2	38.1	37.3	36.9	36.0	35.4	36.0
St. Paul, Minn.....	18.6	17.7	16.9	16.2	15.6	15.4	14.8	15.5	15.0	15.7	17.3	18.9	20.8	21.9	22.7	23.6	24.2	23.9	22.8	21.9	21.0	20.4	19.6	18.8	19.1
Salt Lake City, Utah..	30.9	30.7	30.4	30.0	29.5	29.2	28.9	28.9	27.7	27.1	27.8	29.4	30.9	32.1	33.2	34.0	34.5	34.5	34.6	34.2	33.1	32.2	31.8	31.4	31.1
San Diego, Cal.....	53.0	52.4	51.4	51.1	50.7	50.2	49.7	49.6	49.1	49.7	52.3	55.8	57.5	59.2	60.0	60.2	61.0	60.6	59.6	59.0	57.5	56.3	54.7	53.8	54.8
San Francisco, Cal....	50.0	49.6	49.4	48.9	48.7	48.5	48.1	47.9	47.7	47.3	47.8	48.4	49.5	50.6	52.2	53.4	53.9	54.0	53.4	52.9	52.0	51.2	50.8	50.5	50.3
Savannah, Ga.....	52.9	52.4	51.9	51.5	51.0	51.1	51.0	51.6	53.9	56.5	58.7	60.2	62.0	62.6	63.1	62.3	60.9	59.0	57.1	56.4	55.4	54.8	54.1	53.6	55.9
Washington, D. C....	33.7	33.1	32.6	32.4	32.0	31.9	32.1	33.1	34.0	35.6	37.1	39.0	40.5	41.6	41.9	42.0	41.5	40.4	38.9	38.0	37.1	36.3	35.6	34.9	36.5

*Not received in time for publication. †Thermograph out of order.

TABLE VI.—*Mean pressure for each hour of seventy-fifth meridian time, February, 1897.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Bismarck, N. Dak...	28.186	.186	.186	.184	.177	.175	.173	.170	.166	.172	.171	.172	.164	.152	.137	.131	.133	.141	.151	.155	.160	.168	.177	.185	.166
Boston, Mass.....	29.918	.920	.918	.920	.921	.922	.928	.939	.941	.945	.942	.925	.908	.898	.895	.899	.901	.908	.918	.921	.924	.929	.928	.925	.921
Buffalo, N. Y.....	29.202	.203	.201	.198	.199	.205	.209	.212	.225	.223	.225	.214	.198	.186	.181	.184	.189	.196	.200	.204	.206	.206	.209	.208	.203
Chicago, Ill.....	29.164	.158	.155	.155	.155	.157	.160	.170	.178	.178	.178	.176	.161	.146	.137	.136	.137	.143	.148	.154	.161	.163	.161	.161	.158
Cincinnati, Ohio ...	29.387	.389	.389	.385	.386	.392	.398	.406	.416	.414	.412	.410	.390	.374	.365	.361	.362	.368	.379	.384	.386	.390	.393	.389	.389
Cleveland, Ohio*...																									
Detroit, Mich.....	29.250	.255	.256	.251	.250	.254	.260	.264	.272	.273	.274	.269	.256	.243	.236	.239	.241	.246	.258	.260	.261	.262	.264	.261	.257
Dodge City, Kans..	27.338	.340	.341	.344	.340	.340	.347	.351	.361	.370	.371	.368	.362	.345	.323	.302	.290	.295	.303	.312	.317	.320	.327	.331	.335
Eastport, Me.....	29.923	.922	.917	.918	.920	.923	.936	.945	.952	.954	.947	.934	.919	.912	.910	.912	.917	.927	.935	.939	.936	.932	.927	.928	.929
Galveston, Tex.....	30.042	.036	.031	.025	.023	.019	.027	.039	.048	.061	.065	.064	.056	.032	.013	.002	.996	.996	.000	.005	.016	.028	.035	.041	.029
Havre, Mont.....	27.212	.215	.215	.215	.218	.216	.220	.222	.226	.232	.238	.242	.246	.243	.232	.222	.218	.218	.215	.215	.220	.220	.220	.222	.223
Kansas City, Mo....	29.017	.014	.006	.005	.000	.000	.004	.010	.021	.034	.041	.047	.041	.024	.004	.996	.995	.995	.001	.005	.010	.014	.016	.015	.013
Key West, Fla.....	30.084	.076	.065	.060	.060	.068	.080	.095	.109	.120	.121	.110	.091	.070	.058	.050	.052	.059	.071	.083	.094	.103	.104	.098	.082
Memphis, Tenn.....	29.624	.625	.624	.621	.615	.618	.630	.639	.648	.660	.662	.660	.642	.618	.601	.594	.591	.593	.601	.611	.619	.626	.631	.632	.624
New Orleans, La....	30.005	.007	.004	.000	.999	.999	.021	.037	.053	.065	.073	.066	.051	.027	.008	.999	.993	.996	.999	.011	.017	.022	.024	.023	.021
New York, N. Y....	29.734	.727	.722	.718	.718	.721	.736	.752	.757	.757	.753	.737	.719	.709	.707	.709	.716	.721	.735	.725	.730	.735	.739	.741	.729
Philadelphia, Pa....	29.958	.956	.958	.958	.960	.963	.976	.987	.992	.991	.986	.972	.954	.939	.935	.933	.936	.942	.951	.952	.961	.962	.964	.960	.960
Pittsburg, Pa.....	29.156	.160	.157	.160	.160	.162	.166	.169	.172	.171	.168	.159	.143	.128	.126	.128	.132	.140	.152	.154	.155	.155	.155	.158	.154
Portland, Oreg.....	29.815	.817	.816	.817	.814	.810	.807	.804	.803	.805	.813	.824	.835	.828	.818	.804	.799	.797	.794	.793	.799	.806	.806	.814	.809
St. Louis, Mo.....	29.463	.459	.460	.455	.451	.456	.459	.465	.474	.483	.486	.481	.468	.449	.432	.429	.424	.427	.434	.442	.449	.456	.461	.460	.455
St. Paul, Minn.....	29.110	.110	.110	.110	.107	.107	.105	.106	.110	.118	.124	.122	.115	.100	.088	.081	.083	.085	.092	.101	.101	.103	.106	.105	.104
Salt Lake City, Utah	25.601	.598	.598	.595	.591	.591	.594	.596	.599	.606	.615	.622	.627	.621	.609	.595	.592	.588	.585	.585	.586	.587	.589	.589	.598
San Diego, Cal.....	30.018	.020	.012	.011	.006	.997	.986	.990	.987	.997	.013	.030	.035	.038	.026	.007	.989	.978	.976	.975	.979	.986	.996	.004	.002
San Francisco, Cal..	29.950	.951	.955	.955	.956	.949	.942	.938	.940	.948	.964	.972	.977	.979	.962	.948	.931	.924	.920	.918	.924	.931	.937	.941	.946
Savannah, Ga.....	29.976	.976	.977	.975	.975	.987	.997	.008	.017	.020	.020	.011	.990	.966	.951	.945	.946	.950	.960	.973	.976	.982	.988	.985	.981
Washington, D. C...	29.976	.976	.971	.967	.976	.983	.989	.000	.008	.003	.000	.986	.962	.949	.942	.943	.948	.954	.965	.969	.974	.976	.976	.976	.974

*Not received in time for publication.

TABLE VII.—*Average wind movement for each hour of seventy-fifth meridian time, February, 1897.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex.	8.3	8.2	8.9	8.6	8.5	7.9	7.1	7.3	8.1	7.4	9.0	11.5	12.8	12.9	13.5	13.4	14.1	13.1	12.9	9.4	8.2	8.4	8.6	9.0	9.9
Albany, N. Y.	7.7	8.1	7.0	7.2	7.1	7.2	7.4	7.3	7.8	9.1	9.0	9.3	10.1	10.1	10.0	9.0	8.8	8.0	8.0	8.9	8.5	8.4	7.6	7.7	8.3
Alpena, Mich.	9.2	9.1	9.1	9.0	9.0	8.5	9.2	9.8	10.2	11.3	12.4	12.7	12.8	12.1	12.3	12.2	12.2	10.8	9.2	8.5	8.4	8.8	8.0	9.0	10.2
Amarillo, Tex.	13.6	14.1	14.4	14.8	14.2	14.1	13.7	14.2	13.2	13.0	13.3	14.6	15.4	16.1	16.5	17.1	18.2	18.0	16.1	14.2	14.4	14.6	15.6	14.4	14.9
Atlanta, Ga.	11.4	11.3	11.7	11.8	12.0	11.4	10.9	10.7	11.2	12.1	11.8	11.8	12.1	12.1	12.5	11.9	11.2	11.0	10.1	10.6	10.9	11.0	11.0	11.2	11.4
Atlantic City, N. J.	10.2	10.8	11.4	11.2	11.6	10.9	12.1	12.7	13.6	14.7	15.5	14.8	15.0	15.0	14.7	14.5	13.8	12.3	11.7	11.4	11.5	10.6	10.4	10.5	12.5
Augusta, Ga.	6.4	6.4	6.4	5.5	5.5	5.1	4.9	5.5	5.6	6.9	7.9	8.4	8.9	8.9	9.1	9.1	7.9	7.7	6.8	6.0	5.9	5.8	5.1	5.8	6.7
Baker City, Oreg.	5.8	5.8	6.0	5.6	5.4	5.3	5.0	6.1	6.2	5.9	5.7	6.4	6.2	5.4	6.1	5.8	5.9	6.4	5.8	5.3	4.9	4.4	5.5	5.2	5.7
Baltimore, Md.	5.0	5.1	5.0	4.6	4.7	4.7	4.5	4.8	5.3	7.1	7.4	7.2	7.0	7.1	7.1	6.9	6.8	6.1	5.5	5.7	4.9	5.0	4.8	4.7	5.7
Bismarck, N. Dak.	7.5	6.7	6.8	6.9	6.8	6.4	6.7	6.7	6.8	6.6	7.3	8.4	9.8	10.8	11.2	11.4	10.8	10.5	9.4	8.8	7.9	8.1	7.7	7.6	8.2
Block Island, R. I.	16.7	17.6	17.9	18.8	17.9	17.5	16.5	16.2	17.3	17.6	17.7	17.5	18.0	19.9	20.0	19.6	18.4	18.2	17.4	17.5	16.6	16.9	17.2	17.5	17.8
Boston, Mass.	11.4	11.7	11.4	11.6	11.4	10.9	11.1	11.4	10.9	12.0	12.4	13.0	13.0	13.6	13.5	13.0	12.8	11.3	11.4	11.2	11.4	11.9	11.8	11.2	11.9
Buffalo, N. Y.	16.4	16.1	15.0	15.6	16.2	16.5	16.6	17.2	18.8	18.8	18.5	18.1	18.1	18.2	18.3	18.4	17.8	16.6	17.1	18.2	18.1	18.2	16.5	15.7	17.3
Cairo, Ill.	8.3	7.9	7.7	7.3	7.8	7.8	7.6	7.2	7.9	9.8	10.6	10.5	10.0	10.6	10.6	10.8	10.4	9.8	8.7	8.2	9.2	8.6	8.9	8.8	9.0
Cape Henry, Va.	12.8	12.8	13.0	12.3	13.1	13.5	13.1	13.8	14.0	14.5	13.7	13.8	12.8	12.3	11.6	11.1	11.3	10.4	10.7	11.4	11.8	13.1	13.4	13.0	12.6
Charleston, S. C.	11.5	10.4	10.4	10.5	11.1	10.9	11.0	10.7	11.9	12.1	12.7	13.2	13.2	14.6	15.3	14.9	14.0	12.9	11.1	10.9	10.7	11.0	10.7	10.6	11.9
Charlotte, N. C.	7.6	8.5	8.2	7.6	7.6	6.6	7.2	7.3	7.2	8.1	8.6	9.5	9.8	9.7	9.5	9.4	9.3	8.0	6.6	7.0	7.1	7.0	7.4	7.6	8.0
Chattanooga, Tenn.	6.6	7.5	6.9	7.2	7.7	7.4	7.2	7.4	8.0	8.8	9.0	9.0	10.0	10.6	10.6	10.3	10.7	9.9	9.1	8.5	7.5	7.9	7.3	7.0	8.4
Cheyenne, Wyo.	8.5	9.4	10.2	9.3	9.4	8.9	8.4	8.6	9.0	9.1	10.2	12.9	15.3	14.4	15.1	15.5	16.5	15.7	15.3	13.6	11.8	9.5	9.0	7.8	11.4
Chicago, Ill.	15.8	15.0	15.5	15.1	14.1	13.8	13.8	14.8	15.3	16.7	17.0	17.6	18.6	18.5	18.9	18.7	18.4	17.8	17.6	17.0	17.3	17.1	16.6	16.6	16.6
Cincinnati, Ohio.	7.6	7.6	7.5	7.2	7.2	7.0	6.6	6.7	7.8	8.0	8.5	9.5	10.3	10.4	10.1	10.5	10.4	9.7	9.3	8.6	8.8	8.9	8.3	8.1	8.5
Cleveland, Ohio.	15.1	15.5	14.7	13.5	13.2	13.4	13.2	13.5	13.2	13.4	13.6	13.7	13.8	14.0	15.0	14.7	14.1	13.5	13.5	13.5	14.5	15.5	13.5	15.9	14.1
Columbia, Mo.	8.3	8.8	8.9	9.3	9.2	9.2	9.9	10.0	9.6	9.9	10.8	11.4	11.2	11.8	11.8	11.7	10.9	10.0	9.0	8.5	8.5	8.6	8.6	8.2	9.7
Columbus, Ohio.	7.5	8.0	8.1	7.5	7.3	7.2	7.5	7.5	7.4	8.4	8.7	9.2	9.7	9.5	10.0	9.6	9.8	9.4	9.1	9.1	8.6	8.2	8.0	7.9	8.5
Concordia, Kans.	5.7	5.8	5.2	5.3	5.9	5.7	5.6	5.8	6.1	6.4	6.8	7.2	8.0	8.1	8.5	8.5	8.6	8.2	7.0	5.7	4.9	5.5	5.6	5.7	6.5
Corpus Christi, Tex.	11.4	11.4	11.4	10.9	11.0	10.4	9.8	9.1	8.7	9.4	10.3	11.1	12.3	12.4	13.0	12.8	13.1	12.7	12.8	11.4	11.0	11.2	11.2	11.3	11.3
Davenport, Iowa.	7.8	6.5	6.4	6.3	6.4	6.4	6.9	7.4	7.5	8.7	9.6	9.9	10.3	10.7	10.6	10.7	10.6	10.1	9.2	8.7	8.9	9.0	9.1	8.4	8.6
Denver, Colo.	6.7	6.8	6.1	6.8	6.6	6.0	6.1	6.1	6.1	6.6	7.0	8.0	8.5	8.5	9.4	10.2	10.2	9.5	8.8	7.7	6.8	7.1	7.4	6.8	7.5
Des Moines, Iowa.	6.6	6.3	6.4	6.6	6.1	6.5	7.1	7.1	7.5	8.2	9.0	9.4	10.5	10.1	10.9	10.8	10.9	9.9	8.7	8.1	7.5	6.7	6.9	7.0	8.1
Detroit, Mich.	9.4	9.5	9.8	10.2	10.1	10.0	9.9	9.6	9.5	9.6	9.4	10.5	10.6	11.6	11.9	11.4	11.2	11.0	10.2	10.4	10.8	10.9	10.9	10.5	10.4
Dodge City, Kans.	9.1	8.8	8.1	8.5	8.4	8.6	8.9	9.0	9.3	9.5	10.2	10.2	10.9	11.7	11.2	11.5	11.1	10.4	8.4	6.8	7.7	7.9	7.8	7.9	9.2
Dubuque, Iowa.	5.8	5.4	5.2	5.0	4.6	4.8	4.9	5.2	6.2	6.5	6.9	7.2	7.6	8.2	8.1	8.3	7.8	7.2	7.0	6.8	6.4	6.4	6.2	6.0	6.4
Duluth, Minn.	10.3	10.8	11.1	10.2	9.9	8.9	8.5	8.0	8.5	8.9	9.0	9.3	9.9	9.8	10.4	10.4	10.4	10.5	10.9	10.1	10.5	10.4	11.6	10.8	10.0
Eastport, Me.	11.2	10.8	11.5	11.3	12.2	13.2	12.4	13.3	13.9	13.8	13.6	13.5	12.8	12.3	12.3	12.3	12.0	11.7	11.3	11.7	11.5	11.8	12.0	12.2	12.3
El Paso, Tex.	12.8	12.6	11.6	12.6	13.1	12.2	12.2	11.4	10.7	10.3	11.3	13.5	14.2	16.6	17.4	18.5	18.9	19.1	18.9	16.5	13.6	13.1	13.5	12.8	14.1
Erie Pa.	10.7	11.5	11.9	11.8	12.2	12.1	11.8	11.9	10.9	11.0	11.6	11.9	12.6	12.8	12.5	12.6	12.0	11.8	10.9	10.4	10.2	10.7	11.1	11.0	11.6
Eureka, Cal.	5.2	5.8	5.5	5.4	5.4	4.8	4.0	3.6	3.8	4.6	4.0	4.1	5.0	5.9	6.0	6.7	7.6	8.1	8.6	9.5	8.1	7.1	6.4	6.2	5.9
Fort Canby, Wash.	14.3	15.7	15.0	15.0	15.8	15.6	15.2	15.9	17.0	17.2	16.2	15.6	16.2	16.5	15.2	15.2	14.4	14.1	14.1	13.4	12.9	12.6	13.2	13.5	15.0
Fort Smith, Ark.	7.8	8.3	7.4	7.9	7.9	8.0	7.8	7.9	7.8	8.0	9.1	9.0	9.8	9.7	10.0	10.4	10.9	10.4	9.5	8.2	8.4	8.2	8.0	8.2	8.7
Fresno, Cal.	4.0	3.4	3.6	3.7	3.7	3.5	3.6	3.7	4.0	4.5	4.6	4.8	5.7	6.6	7.4	7.0	7.0	6.2	6.0	6.1	4.1	3.8	3.7	3.8	4.8
Galveston, Tex.	12.6	12.0	12.0	12.1	11.9	12.1	11.6	10.9	10.9	10.6	11.1	11.4	11.6	11.1	11.5	11.0	10.6	10.1	10.2	10.9	11.2	12.1	12.2	12.3	11.4
Grand Haven, Mich.	11.6	11.8	11.1	10.7	10.9	9.9	9.8	9.2	9.7	9.8	10.9	11.0	12.0	11.8	11.8	12.0	11.8	11.0	11.4	10.7	10.9	11.5	11.9	12.1	11.0
Greenbay, Wis.	7.1	7.6	7.7	7.6	7.4	7.4	7.3	7.6	8.2	9.0	9.4	9.4	10.2	10.6	10.7	10.4	10.5	9.4	8.8	8.3	8.3	8.0	7.6	7.2	8.6
Hannibal, Mo.	6.6	6.9	6.8	7.4	8.0	8.1	8.4	8.9	8.9	10.0	10.2	11.3	11.9	12.1	12.1	12.4	11.7	11.0	9.0	7.8	7.6	7.9	7.2	6.5	9.1
Harrisburg, Pa.	7.1	7.7	7.8	7.4	7.0	7.5	7.3	7.0	8.4	9.4	9.5	10.0	9.9	10.6	9.9	9.2	9.1	8.3	7.3	6.9	6.8	7.1	6.9	7.1	8.1
Hatteras, N. C.	14.2	14.9	15.5	15.7	15.9	15.3	15.5	16.3	16.2	15.5	15.0	14.0	13.5	14.8	14.4	13.9	13.6	13.6	13.4	13.1	12.8	13.6	13.3	13.9	14.5
Havre, Mont.	9.2	8.5	8.3	7.9	7.4	7.6	7.8	7.0	7.3	7.6	7.8	7.8	9.1	9.9	10.2	9.5	9.7	10.1	9.1	8.1	8.5	8.2	7.8	8.2	8.4
Helena, Mont.	7.9	7.1	7.5	8.1	8.2	7.4	7.0	6.0	5.2	5.1	5.8	5.9	7.5	7.0	7.1	7.5	7.5	7.6	7.1	5.8	6.4	6.5	7.0	7.6	6.9
Huron, S. Dak.	12.0	12.1	11.2	10.8	11.1	11.3	11.2	11.6	11.7	11.8	12.1	13.5	14.7	15.5	15.2	15.9	15.9	14.9	14.6	13.7	13.1	13.4	13.8	12.4	13.1
Idaho Falls, Idaho.	12.3	11.4	11.3	11.3	10.8	10.5	10.2	9.4	9.2	8.8	9.0	9.9	10.6	11.2	11.9	12.8	13.4	13.6	12.6	11.6	11.1	10.6	11.0	11.3	11.1
Indianapolis, Ind.	9.5	8.8	8.5	8.0	9.0	8.6	8.9	9.2	9.9	10.5	11.0	11.1	10.9	11.6	12.1	12.2	12.1	11.5	10.2	10.0	9.8	10.1	10.5	9.7	10.2
Jacksonville, Fla.	7.1	6.9	7.1	7.1	7.7	7.1	7.1	7.2	8.0	9.0	9.9	11.0	11.0	11.4	11.5	10.5	10.1	9.4	8.2	8.7	7.4	6.5	6.4	6.5	8.5
Jupiter, Fla.	8.2	8.8	8.9	8.7	9.1	8.7	8.5	9.2	10.0	12.5	13.6	14.8	14.8	14.8	14.8	14.9	14.3	13.3	11.0	10.8	10.7	10.1	9.5	8.5	11.2
Kansas City, Mo.	7.7	7.5	7.9	8.4	8.2	8.1	7.8	7.8	8.3	8.0	8.5	8.4	8.8	9.2	9.0	8.5	8.6	7.8	7.6	7.5	7.1	7.4	7.4	7.5	8.0
Keokuk, Iowa.	6.5	6.3	6.6	7.0	7.1	7.2	6.9	6.7	7.5	8.1	8.8	8.8	9.4	10.2	10.0	10.3	10.0	9.4	8.2	7.9	7.7	7.2	6.9	6.6	8.0
Key West, Fla.	8.5	8.4	8.2	8.8	8.8	8.8	8.5	9.1	9.5	10.1	11.2	10.0	11.2	11.6	11.2	10.6	9.6	9.3	8.1	8.5	8.8	9.4	9.8	9.1	9.5
Kittyhawk, N. C.	15.0	16.4	16.4	15.8	16.6	16.4	15.5	15.2	15.5	16.1	15.4	15.2	14.6	14.7	14.0	14.4	14.3	13.3	12.4	12.8	12.7	13.0	13.1	14.4	14.7
Knoxville, Tenn.	4.9	5.1	5.8	5.6	5.6	5.3	5.4	5.4	5.9	6.1	6.6	7.6	8.5	9.2	8.9	8.5	7.9	7.2	6.1	5.3	5.2	4.5	4.4	4.7	6.2
La Crosse, Wis.	6.0	5.9	6.0	6.8	6.3	6.4	6.8	6.3	6.2	6.4	6.7	6.8	7.1	7.8	7.9	8.0	8.2	8.1	7.4	6.6	6.4	6.6	6.1	5.9	6.8
Lander, Wyo.	3.4	3.4	3.6	4.0	4.1	3.9	3.7	2.9	3.0	2.9	2.7	3.0	3.9	5.1	5.0	5.2	5.2	5.2	5.1	5.1	4.4	3.8	4.1	3.7	4.0
Lexington, Ky.	11.9	11.7	11.1	11.1	10.6	10.7	12.0	10.9	10.6	11.7	12.3	12.6	13.9	13.9	13.6	14.1	13.5	12.9	12.5	12.4	11.9	11.1	11.0	11.6	12.0
Little Rock, Ark.	7.7	7.2	7.0	7.5	7.9	7.2	7.8	7.2	7.4	8.2	9.5	9.0	9.9	9.5	9.1	9.2	9.4	9.4	8.6	7.2	6.8	6.9	7.4	7.5	8.1
Los Angeles, Cal.	3.8	3.7	4.2	3.8	4.2	4.3	4.6	4.4	5.4	5.1	5.6	5.9	5.4	6.6	6.1	6.5	7.0	7.7	7.6	6.3	5.2	4.3	3.4	3.6	5.2
Louisville, Ky.	7.2	7.4	7.6	7.8	7.2	7.4	7.0	6.8	7.0	8.5	9.6	10.2	11.0	11.7	11.3	11.2	11.0	10.6	8.9	8.9	8.9	8.5	8.6	8.3	8.9
Lynchburg, Va.	3.7	3.5	3.3	3.3	3.0	3.5	3.4	3.9	4.5	5.0	5.4	5.7	5.9	5.9	6.0	6.5	5.7	5.1	5.1	4.7	4.4	4.6	4.4	4.1	4.6
Marquette, Mich.	8.1	8.6	9.5	8.8	9.3	9.4	9.0	9.1	8.3	8.6	8.3	8.4	8.9	8.6	9.1	8.8	8.3	7.7	7.2	7.8	7.6	8.7	8.0	7.9	8.5
Memphis, Tenn.	9.5	10.6	9.8	9.7	10.4	10.7	9.8	10.0	10.7	11.5	11.6	11.7	10.9	11.1	11.4	11.2	11.2	10.2	10.5	10.8	10.6	10.4	10.2	9.4	10.6
Miles City, Mont.	4.9	4.5	4.4	4.6	4.6	5.0	5.5	5.0	5.5	5.0	5.9	5.5	6.0	6.4	7.0	6.7	7.4	7.7	6.9	5.5	4.8	4.6	4.8	5.2	5.6
Milwaukee, Wis.	11.4	11.9	11.4	10.4	10.3	9.8	10.4	10.3	10.7	11.2	12.0	12.1	12.9	12.9	13.1	13.6	12.5	12.1	11.7	11.4	11.8	11.3	11.5	11.9	11.6
Mobile, Ala.	9.0	8.3	8.2	7.6	8.0	7.8	7.5	7.8	7.6	8.4	8.7	9.2	10.0	10.4	10.8	10.9	11.4	10.8	10.2	8.9	8.1	7.8	8.0	8.1	8.9
Montgomery, Ala.	7.3	6.0	6.3	6.6	6.7	5.9	6.5	6.8	7.1	7.5	7.5	8.1	8.9	9.4	9.1	9.2	8.4	8.2	7.2	7.3	7.6	7.8	8.1	7.6	7.6
Moorhead, Minn.	11.4	11.1	10.7	11.1	10.5	9.5	8.6	9.1	9.3	8.8	9.2	9.0	10.5	11.8	12.5	13.2	13.2	13.1	12.5	12.3	11.7	12.0	12.2	11.7	11.0
Nantucket, Mass.	13.1	13.1	13.2	13.2	13.9	14.3	13.7	13.5	13.6	14.1	13.6	13.5	13.9	13.1	13.4	13.2	12.8	12.1	12.1	12.2	12.4	12.8	13.3	13.8	13.2
Nashville, Tenn.	6.9	6.2	6.7	6.4	6.4	6.2	6.5	6.7	7.3	8.0	8.8	8.7	8.8	9.4	9.4	9.2	8.9	8.4	7.2	6.8	6.6	7.0	7.0	7.0	7.5
New Haven, Conn.	10.0	9.9	10.0	9.9	9.8	9.4	10.1	10.4	10.2	10.5	11.4	12.2	13.3	13.2	13.7	13.4	12.2	10.5	9.2	8.6	9.2	9.6	10.2	9.9	10.7
New Orleans, La.	8.6	9.5	9.2	8.9	9.0	8.8	9.0	9.2	9.6	9.9	10.4	11.0	11.2	11.9	12.4	11.9	11.4	10.7	9.5	9.5	8.6	8.6	8.7	7.9	9.8
New York, N. Y.	12.9	13.0	12.2	12.0	12.1	12.8	13.8	14.0	12.8	14.2	14.9	14.9	15.6	15.4	15.7	16.3	15.6	14.5	14.3	14.0	14.7	13.1	12.9	13.7	14.0
Norfolk, Va.	7.7	7.5	7.9	7.7	7.8	7.8	7.8	8.5	9.5	9.3	9.5	9.3	9.4	8.9	8.9	8.9	8.4	8.1	7.8	7.7	7.8	7.9	7.9	7.6	8.3
Northfield, Vt.	7.5	8.3	8.6	8.2	7.8	7.3	6.6	6.6	6.7	6.8	8.4	10.1	10.2	9.8	10.0	9.6	8.6	7.0	6.8	7.1	8.3	7.9	6.8	7.2	8.0
North Platte, Nebr.	6.1	6.5	6.8	6.8	7.8	7.9	7.1	6.2	6.5	6.4	7.1	7.6	8.3	8.8	9.8	10.0	10.1	8.6	8.3	7.5	7.7	7.8	7.1	6.1	7.6
Oklahoma, Okla.	7.6	7.7	7.5	7.2	7.6	8.0	8.5	8.4	8.1	9.4	10.3	10.1	10.6	11.3	10.9	11.3	11.2	10.2	9.0	7.5	7.9	8.3	8.5	8.2	9.0
Omaha, Nebr.	6.9	7.4	7.2	6.9	6.4	6.7	7.2	7.5	6.9	7.6	8.4	8.8	8.4	9.5	9.3	9.3	9.6	8.9	8.2	7.4	7.3	7.2	7.1	7.0	7.8
Oswego, N. Y.	15.0	15.0	13.8	14.1	13.1	13.0	12.9	13.1	13.0	13.0	13.5	12.5	13.2	13.6	14.4	14.0	13.2	13.2	13.0	13.1	13.9	14.2	14.2	13.6	13.6
Palestine, Tex.	7.5	7.9	7.4	7.3	7.6	7.8	7.3	7.1	6.7	8.0	9.5	9.9	10.3	10.9	10.8	10.9	10.5	10.2	9.1	7.8	7.4	7.5	7.5	7.9	8.5
Parkersburg, W. Va.	6.1	5.9	6.4	5.9	5.6	5.4	5.3	5.4	5.3	5.6	6.0	6.4	7.1	7.0	7.1	7.2	7.3	6.8	6.2	6.4	6.0	6.1	5.6	6.1	6.2

TABLE VII.—*Average wind movement, etc.*—Continued.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Pensacola, Fla.	10.9	10.9	10.9	11.0	10.9	10.6	9.1	9.4	9.6	10.5	11.1	11.6	10.9	11.4	11.4	11.9	11.9	11.6	10.5	10.1	9.5	9.4	9.4	9.5	10.6
Philadelphia, Pa.	9.3	9.8	10.0	10.0	9.5	9.3	10.0	10.7	11.2	12.0	12.9	13.1	13.4	13.7	13.6	13.1	12.6	11.7	10.9	10.1	9.2	9.2	9.4	9.9	11.0
Phœnix, Ariz	3.1	3.6	3.4	3.6	4.2	3.7	3.6	3.4	3.7	3.2	3.6	3.6	4.0	4.2	4.8	5.0	5.6	5.6	5.2	4.4	3.0	2.9	2.9	2.6	3.9
Pierre, S. Dak.	8.1	8.5	7.9	7.2	8.4	8.0	8.2	7.2	7.0	7.6	8.4	8.2	9.0	9.6	9.4	9.6	8.8	8.5	8.4	8.8	8.3	7.9	7.5	7.5	8.2
Pittsburg, Pa.	6.5	6.8	6.2	6.2	6.6	6.6	6.6	6.2	6.6	6.9	7.4	7.3	7.4	7.7	7.4	7.9	7.1	7.2	6.9	6.4	6.5	6.8	7.0	6.7	6.9
Port Angeles, Wash.	5.0	5.5	5.5	5.3	5.8	5.7	5.4	5.4	5.5	5.2	4.9	5.0	4.8	4.7	5.6	5.5	6.6	7.0	6.0	5.3	5.1	4.6	5.0	5.2	5.4
Port Huron, Mich.	9.6	9.7	10.1	10.9	9.6	9.1	9.1	9.2	9.7	10.4	11.3	11.6	13.0	12.8	13.7	14.0	13.5	11.9	11.4	11.0	11.1	11.3	10.9	10.9	11.1
Portland, Me.	6.8	7.2	7.5	7.6	7.4	8.1	7.2	7.8	7.9	8.7	8.7	8.9	8.0	9.0	8.8	8.3	8.0	6.5	6.4	6.4	7.0	6.9	6.1	6.6	7.6
Portland, Oreg.	8.6	7.7	8.1	8.1	7.8	7.9	8.2	8.1	8.1	9.0	9.5	9.4	10.1	10.8	12.3	11.8	10.7	10.8	9.6	8.7	7.1	6.9	7.8	8.0	9.0
Pueblo, Colo.	5.3	4.4	4.8	4.9	4.6	4.8	5.0	4.7	4.5	4.0	4.9	6.2	6.6	8.0	10.0	10.6	10.6	10.6	10.9	9.2	8.5	7.9	7.0	5.4	6.8
Raleigh, N. C.	7.7	7.5	7.6	7.7	7.2	7.0	6.2	6.2	7.0	7.5	8.2	7.8	8.4	9.0	9.1	8.7	8.1	6.6	5.9	6.7	7.2	6.6	7.0	7.6	7.4
Rapid City, S. Dak.	6.0	5.9	5.6	5.1	5.5	6.4	6.4	5.4	5.9	6.1	6.9	7.5	8.4	9.7	10.0	10.5	9.7	9.1	7.2	6.6	5.7	5.3	5.5	6.2	6.9
Redbluff, Cal.	4.6	4.9	5.2	5.7	5.8	5.4	5.3	6.2	6.1	5.7	5.3	5.3	5.9	6.2	6.6	7.1	6.9	6.7	6.4	6.4	5.8	5.9	5.6	5.1	5.8
Rochester, N. Y.	9.1	8.5	8.6	8.4	8.2	8.2	8.1	8.9	9.8	10.6	11.9	11.8	11.9	11.4	11.3	10.5	9.8	9.7	9.1	9.0	9.1	8.7	8.7	8.7	9.6
Roseburg, Oreg.	2.7	3.0	2.2	2.1	2.0	2.2	2.6	2.4	3.0	3.1	3.6	3.2	3.5	3.6	4.8	5.2	5.6	5.8	5.1	5.2	4.0	3.5	3.0	3.0	3.5
Sacramento, Cal.	9.0	8.6	8.8	9.5	8.8	8.6	8.1	8.6	8.4	8.6	8.1	8.8	9.0	10.4	10.5	10.0	10.2	10.2	9.7	8.8	7.7	8.0	8.2	8.0	8.9
St. Louis, Mo.	9.5	9.4	9.0	9.2	9.5	9.8	10.2	10.5	11.0	11.0	11.5	12.1	11.5	12.0	12.6	11.7	11.7	11.8	10.7	10.4	9.8	10.1	10.2	9.4	10.6
St. Paul, Minn.	6.6	6.9	7.2	7.1	6.8	6.2	6.1	5.9	6.2	6.4	7.6	8.1	8.5	9.0	9.4	9.0	9.4	8.6	7.0	6.7	6.5	6.6	6.8	6.6	7.3
Salt Lake City, Utah.	4.5	5.1	4.8	5.0	4.7	5.4	5.4	5.3	5.5	5.0	4.8	5.0	6.2	6.6	7.2	7.7	7.6	7.5	6.5	5.1	5.1	4.4	4.5	4.6	5.6
San Antonio, Tex.	8.2	6.8	7.2	7.1	6.5	6.3	6.8	6.8	7.1	7.5	9.3	9.5	10.0	10.5	11.1	10.8	11.2	11.4	10.4	9.1	9.8	9.6	9.6	9.4	8.8
San Diego, Cal.	4.2	4.9	4.8	5.0	4.1	4.0	3.8	4.0	3.8	4.8	4.1	4.4	5.5	6.1	7.2	8.2	9.0	9.0	9.0	8.2	6.6	4.8	4.4	4.6	5.6
Sandusky, Ohio	9.8	9.7	8.8	8.9	9.1	8.6	8.4	7.9	7.8	8.4	8.6	8.4	9.0	9.6	9.6	9.4	9.0	8.7	9.0	9.8	9.8	10.2	9.5	9.8	9.1
San Francisco, Cal.	8.9	8.4	8.3	7.8	8.6	7.2	7.4	8.5	8.0	8.2	8.3	8.5	9.2	8.6	8.8	10.1	11.6	12.1	12.7	11.9	11.4	11.4	10.9	9.5	9.4
San Luis Obispo, Cal.	3.8	3.0	3.5	3.0	3.2	3.4	2.7	3.7	3.5	3.4	3.6	3.6	4.8	5.6	6.3	6.9	7.6	8.0	7.4	7.6	5.8	4.1	4.1	4.9	4.7
Santa Fe, N. Mex.	6.8	7.1	7.6	6.9	5.8	5.9	5.6	6.0	5.8	6.4	7.9	9.3	9.7	10.0	10.3	10.1	9.2	8.8	8.0	7.0	6.5	6.8	7.5	7.0	7.6
Sault Ste Marie, Mich.	8.8	8.6	8.3	9.0	8.9	7.9	7.9	7.6	7.6	8.1	8.8	9.4	10.0	10.4	11.1	11.6	11.1	9.5	8.6	8.1	7.9	7.9	8.4	8.0	8.9
Savannah, Ga.	8.6	8.9	8.5	9.1	8.7	9.3	8.0	7.9	8.3	8.5	9.6	10.6	10.1	9.9	10.5	10.2	10.0	9.3	9.0	9.6	9.4	9.0	9.0	8.6	9.2
Seattle, Wash.	5.4	5.7	5.5	5.8	6.2	5.8	6.0	5.9	5.5	5.9	5.8	5.7	6.2	6.4	6.9	6.8	7.5	6.7	6.5	5.5	5.2	5.4	5.1	5.2	5.9
Shreveport, La.	8.2	8.0	7.4	7.2	7.5	6.5	6.7	7.2	7.3	7.8	7.7	8.3	8.5	8.2	9.0	9.8	9.6	10.5	9.7	8.9	8.4	9.2	9.2	9.3	8.3
Sioux City, Iowa	8.8	8.0	8.2	8.5	8.2	8.3	8.0	9.1	9.4	9.0	10.3	11.5	11.8	12.6	13.5	13.7	13.0	12.6	11.2	10.5	10.1	10.1	10.2	9.6	10.3
Spokane, Wash.	3.8	3.6	3.4	3.2	3.4	3.7	4.3	4.6	4.2	4.5	4.9	5.0	6.0	6.4	6.9	7.1	7.1	6.9	6.5	5.5	4.6	4.0	3.5	3.7	4.9
Springfield, Ill.	8.0	8.3	7.8	7.9	8.2	8.6	8.8	9.2	9.7	10.4	10.7	10.5	11.0	10.8	11.5	11.5	11.1	10.9	9.8	9.4	9.0	8.9	8.9	8.6	9.6
Springfield, Mo.	10.7	10.5	11.1	11.2	10.5	11.1	11.5	11.2	11.6	11.2	11.6	11.5	11.6	12.1	12.1	12.1	11.8	11.5	10.4	9.5	10.2	10.8	11.0	10.5	11.2
Tampa, Fla.	6.2	5.8	5.8	6.1	6.8	6.8	6.8	7.4	8.6	9.5	10.1	9.8	11.4	11.5	11.5	11.2	10.4	8.5	7.2	6.6	6.0	5.6	5.6	5.4	8.0
Tatoosh Island, Wash.	11.4	14.0	15.2	16.0	16.5	15.8	14.9	15.8	15.6	17.1	17.7	16.2	15.8	16.6	16.3	16.5	16.2	14.0	12.9	13.3	11.8	12.4	12.7	11.4	14.8
Toledo, Ohio	9.8	9.8	9.4	9.5	9.5	9.3	9.0	8.6	8.4	8.5	9.6	10.0	10.4	10.5	10.8	11.2	11.2	11.1	10.4	10.1	10.6	10.8	10.8	9.8	10.0
Vicksburg, Miss.	7.7	7.6	8.1	7.8	7.6	7.3	7.3	6.9	7.6	8.2	7.9	7.9	8.5	8.2	9.1	9.3	8.6	7.5	6.2	6.5	7.0	6.9	7.3	7.3	7.7
Vineyard Haven, Mass	9.0	9.4	9.1	9.2	9.8	9.6	10.1	9.5	10.5	11.2	11.4	11.2	11.4	11.3	11.7	11.4	10.8	9.6	9.2	9.2	9.0	9.1	9.0	8.6	10.0
Walla Walla, Wash.	5.5	5.3	5.2	5.3	5.2	5.3	5.6	6.0	6.0	5.6	6.0	6.0	6.6	7.8	7.9	8.3	8.5	8.6	7.5	6.5	6.2	5.4	5.6	5.4	6.3
Washington, D. C.	5.7	5.8	5.8	6.2	6.1	6.3	6.9	7.0	8.7	9.8	10.1	9.9	10.1	10.1	9.8	9.5	8.9	7.4	6.0	6.3	6.4	6.3	5.4	5.3	7.5
Wichita, Kans.	7.9	7.8	8.0	8.2	7.9	8.0	8.2	7.5	7.6	8.0	8.4	9.7	10.2	10.5	10.3	10.5	10.4	10.0	8.5	7.7	7.6	7.2	7.9	8.2	8.6
Williston, N. Dak.	5.9	5.2	5.9	6.4	6.1	6.8	7.1	7.4	6.6	6.8	8.0	7.6	9.0	9.9	9.8	10.5	9.9	9.4	9.1	8.9	8.4	7.2	6.9	6.5	7.7
Wilmington, N. C.	8.2	9.0	8.5	7.9	8.4	8.5	8.6	8.3	8.4	9.6	9.4	10.1	9.6	10.8	11.3	11.4	11.1	10.0	9.5	10.0	8.8	8.3	7.9	7.8	9.2
Winnemucca, Nev.	10.2	10.1	10.5	9.9	9.8	10.4	10.1	9.7	9.3	10.1	11.2	11.6	11.9	13.8	13.5	13.9	14.4	14.1	13.8	13.5	11.8	10.8	9.9	9.6	11.4
Woods Hole, Mass.	14.5	15.2	14.9	15.0	16.2	16.6	16.0	15.5	15.6	15.5	15.7	15.0	14.4	15.2	15.2	15.2	15.8	15.3	15.0	15.5	15.1	15.1	14.6	14.8	15.3
Yuma, Ariz.	5.5	5.5	5.1	5.2	5.0	5.2	5.3	5.3	5.4	4.6	5.5	7.6	10.8	11.9	12.2	11.7	11.2	10.6	10.7	9.5	7.6	7.3	6.7	5.6	7.5

TABLE VIII.—*Resultant winds from observations at 8 a. m. and 8 p. m., daily, during the month of February, 1897.*

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
New England.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Eastport, Me	22	4	11	28	n. 43 w.	25
Portland, Me	23	11	6	29	n. 62 w.	26
Northfield, Vt	26	25	4	8	n. 76 w.	4
Boston, Mass	23	9	6	31	n. 61 w.	29
Nantucket, Mass	24	12	14	22	n. 34 w.	14
Woods Hole, Mass.*	7	8	5	15	s. 84 w.	10
Block Island, R. I	22	8	13	28	n. 47 w.	20
New Haven, Conn	23	12	4	27	n. 64 w.	26
Middle Atlantic States.						
Albany, N. Y	25	14	6	19	n. 50 w.	17
Binghamton, N. Y†	14	3	10	9	n. 5 e.	11
New York, N. Y	22	11	10	27	n. 57 w.	20
Harrisburg, Pa	17	8	21	22	n. 6 w.	9
Philadelphia, Pa	27	5	13	22	n. 22 w.	24
Atlantic City, N. J	24	9	15	22	n. 25 w.	17
Baltimore, Md	20	3	15	24	n. 28 w.	19
Washington, D. C	30	8	15	13	n. 5 e.	22
Lynchburg, Va	23	13	16	22	n. 31 w.	12
Norfolk, Va	23	14	24	12	n. 53 e.	15
South Atlantic States.						
Charlotte, N. C	11	23	21	11	s. 40 e.	16
Hatteras, N. C	23	13	16	13	n. 17 e.	10
Kittyhawk, N. C	19	14	22	14	n. 58 e.	9
Raleigh, N. C	21	15	14	20	n. 45 w.	8
Wilmington, N. C	22	13	14	18	n. 24 w.	10
Charleston, S. C	19	13	13	24	n. 61 w.	12
Augusta, Ga	8	17	15	24	s. 45 w.	13
Savannah, Ga	14	19	13	21	s. 58 w.	9
Jacksonville, Fla	16	22	8	19	s. 61 w.	12
Florida Peninsula.						
Jupiter, Fla	8	25	12	16	s. 13 w.	18
Key West, Fla	11	25	30	6	s. 60 e.	28
Tampa, Fla	16	24	11	17	s. 37 w.	10
Eastern Gulf States.						
Atlanta, Ga	19	14	15	24	n. 61 w.	10
Pensacola, Fla	21	19	14	15	n. 27 w.	2
Mobile, Ala	24	21	6	10	n. 53 w.	5
Montgomery, Ala	17	20	18	17	s. 18 e.	3
Vicksburg, Miss	17	21	22	6	s. 76 e.	16
New Orleans, La	19	21	19	9	s. 79 e.	10
Western Gulf States.						
Shreveport, La	16	23	18	16	s. 16 e.	7
Fort Smith, Ark	17	7	26	12	n. 54 e.	17
Little Rock, Ark	18	12	19	13	n. 45 e.	8
Corpus Christi, Tex	15	20	27	6	s. 77 e.	22
Galveston, Tex	17	26	18	5	s. 55 e.	16
Palestine, Tex	21	25	10	8	s. 27 e.	4
San Antonio, Tex	23	23	18	8	e.	10
Ohio Valley and Tennessee.						
Chattanooga, Tenn	18	17	13	21	n. 83 w.	8
Knoxville, Tenn	17	3	19	23	n. 16 w.	15
Memphis, Tenn	16	18	20	14	s. 72 e.	6
Nashville, Tenn	17	16	16	17	n. 45 w.	1
Lexington, Ky	27	13	15	19	n. 16 w.	15
Louisville, Ky	21	13	12	18	n. 37 w.	10
Indianapolis, Ind	21	12	14	20	n. 34 w.	11
Cincinnati, Ohio	25	9	18	14	n. 14 e.	16
Columbus, Ohio	16	10	18	21	n. 27 w.	7
Pittsburg, Pa	11	16	16	28	s. 67 w.	13
Parkersburg, W. Va	22	13	11	23	n. 53 w.	15
Lower Lake Region.						
Buffalo, N. Y	13	16	15	25	s. 73 w.	10
Oswego, N. Y	13	21	18	19	s. 7 w.	8
Rochester, N. Y	8	23	14	24	s. 34 w.	18
Erie, Pa	7	13	19	23	s. 34 w.	7
Cleveland, Ohio	14	16	16	22	s. 72 w.	6
Sandusky, Ohio	16	13	21	22	n. 18 w.	3
Toledo, Ohio	17	8	18	24	n. 34 w.	11
Detroit, Mich	19	13	14	23	n. 56 w.	11
Upper Lake Region.						
Alpena, Mich	16	14	10	24	n. 82 w.	14
Grand Haven, Mich	17	9	22	19	n. 21 e.	8
Marquette, Mich	18	11	13	27	n. 63 w.	16
Port Huron, Mich	15	14	15	24	n. 84 w.	9
Sault Ste. Marie, Mich	14	17	17	21	s. 53 w.	5
Chicago, Ill	18	13	15	19	n. 39 w.	6

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
Upper Lake Region—Cont'd.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Milwaukee, Wis	16	14	14	25	n. 80 w	11
Greenbay, Wis	20	19	11	18	n. 82 w.	7
Duluth, Minn	26	10	17	17	n.	16
North Dakota.						
Moorhead, Minn	22	18	17	18	n. 14 w.	4
Bismarck, N. Dak	23	7	21	15	n. 21 e.	17
Williston, N. Dak	20	16	13	15	n. 27 w.	4
Upper Mississippi Valley.						
St. Paul, Minn	8	21	20	21	s. 4 w.	13
La Crosse, Wis.†	6	8	6	9	s. 56 w.	4
Davenport, Iowa	16	12	16	22	n. 56 w.	7
Des Moines, Iowa	16	18	14	19	s. 68 w.	5
Dubuque, Iowa	15	11	17	24	n. 60 w.	8
Keokuk, Iowa	20	11	19	20	n. 6 w.	9
Cairo, Ill	23	12	19	12	n. 32 e.	13
Springfield, Ill	23	11	17	16	n. 5 e.	12
Hannibal Mo	10	5	8	11	n. 31 w.	6
St. Louis, Mo	22	11	18	15	n. 15 e.	11
Missouri Valley.						
Columbia, Mo.*	12	6	10	7	n. 27 e.	7
Kansas City, Mo	20	14	20	12	n. 53 e.	10
Springfield, Mo	18	19	21	12	s. 84 e.	9
Lincoln, Nebr	21	21	18	10	e.	8
Omaha, Nebr	26	18	9	13	n. 27 w.	9
Sioux City, Iowa†	11	9	9	8	n. 27 e.	2
Pierre, S. Dak	22	11	23	15	n. 36 e.	14
Huron, S. Dak	22	21	16	14	n. 63 e.	2
Northern Slope.						
Havre, Mont	20	5	15	30	n. 45 w.	21
Miles City, Mont	23	13	11	21	n. 45 w.	14
Helena, Mont	15	14	1	41	n. 88 w.	40
Rapid City, S. Dak	19	13	17	21	n. 34 w.	7
Cheyenne, Wyo	18	9	2	39	n. 76 w.	38
Lander, Wyo	11	24	11	25	s. 47 w.	19
North Platte, Nebr	18	17	16	19	n. 72 w.	3
Middle Slope.						
Denver, Colo	16	23	10	18	s. 49 w.	11
Pueblo, Colo	16	9	14	27	n. 62 w.	15
Concordia, Kans	21	21	17	10	e.	7
Dodge City, Kans	23	15	14	17	n. 21 w.	8
Wichita, Kans	26	19	18	6	n. 60 e.	14
Oklahoma, Okla	24	21	13	12	n. 18 e.	3
Southern Slope.						
Abilene, Tex	18	21	11	18	s. 67 w.	8
Amarillo, Tex	16	26	8	16	s. 39 w.	13
Southern Plateau.						
El Paso, Tex	21	5	7	39	n. 63 w.	36
Santa Fe, N. Mex	24	15	17	14	n. 18 e.	10
Phœnix, Ariz	15	10	20	22	n. 22 w.	5
Yuma, Ariz	29	8	9	21	n. 30 w.	24
Middle Plateau.						
Carson City, Nev	12	27	9	20	s. 36 w.	19
Winnemucca, Nev	11	21	9	27	s. 61 w.	21
Salt Lake City, Utah	8	27	18	17	s. 3 e.	19
Northern Plateau.						
Baker City, Oreg	19	22	15	16	s. 18 w.	5
Idaho Falls, Idaho	17	37	1	3	s. 6 w.	20
Spokane, Wash	11	23	19	16	s. 14 e.	12
Walla Walla, Wash	3	38	11	11	s.	35
North Pacific Coast Region.						
Fort Canby, Wash	15	20	21	12	s. 61 e.	10
Port Angeles, Wash.*	2	10	12	12	s.	8
Seattle, Wash	11	29	14	11	s. 9 e.	18
Tatoosh Island, Wash	8	15	26	14	s. 60 e.	14
Portland, Oreg	11	31	19	10	s. 24 e.	22
Roseburg, Oreg	11	25	15	17	s. 8 w.	14
Middle Pacific Coast Region.						
Eureka, Cal	10	19	17	21	s. 24 w.	10
Redbluff, Cal	20	22	14	16	s. 45 w.	3
Sacramento, Cal	15	27	20	14	s. 27 e.	13
San Francisco, Cal	13	8	7	34	n. 80 w.	28
South Pacific Coast Region.						
Fresno, Cal	22	7	13	25	n. 39 w.	19
Los Angeles, Cal	21	6	15	24	n. 31 w.	18
San Diego, Cal	24	7	13	24	n. 33 w.	20
San Luis Obispo, Cal	21	7	5	25	n. 55 w.	24

* From observations at 8 p. m. only. † From observations at 8 a. m. only.

TABLE IX.—*Thunderstorms and auroras, February, 1897.*

States.	No. of stations.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total. No.	Total. Days.	
Alabama	50	T.	....	....	....	....	1	....	2	2	....	4	6	4	....	....	2	....	....	....	....	....	....	6	....	....	....	1	....	....	....	....	....	28	9	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Arizona	49	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	1	....	....	....	....	....	....	....	....	....	4	3	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Arkansas	50	T.	1	....	....	2	....	1	7	....	....	....	....	....	....	....	....	....	....	1	....	5	6	6	....	....	....	....	....	....	....	....	....	29	8	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
California	197	T.	6	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	6	6	1	1	....	....	....	....	....	....	3	....	....	....	24	7	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Colorado	71	T.	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Connecticut	14	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Delaware	4	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	3	1	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Dist. of Columbia	4	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	1	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Florida	38	T.	2	1	....	....	8	2	....	1	....	2	1	....	2	....	2	....	....	1	....	....	....	....	....	1	1	....	....	....	....	....	....	24	12	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Georgia	50	T.	....	....	....	....	1	....	....	1	....	1	3	1	....	....	5	....	....	1	1	....	1	3	1	1	....	....	....	....	....	....	....	20	12	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Idaho	36	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Illinois	97	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	3	42	23	5	....	....	....	....	....	....	....	....	....	74	5	T.
		A.	....	1	3	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	6	4	A.
Indiana	49	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	31	10	7	....	....	....	....	....	....	....	....	....	51	5	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Indian Territory	7	T.	....	....	1	....	....	2	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	2	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Iowa	101	T.	....	....	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	3	14	3	1	....	....	....	....	....	....	....	....	....	32	5	T.
		A.	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9	5	....	....	....	....	....	....	....	....	....	....	4	1	A.
Kansas	73	T.	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	....	....	....	....	....	15	3	T.
		A.	1	1	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	10	1	25	21	19	....	....	....	....	....	....	....	....	....	7	7	A.
Kentucky	47	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	77	6	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Louisiana	51	T.	1	....	....	9	2	1	10	....	....	10	8	1	....	1	12	1	....	1	1	....	....	4	....	....	....	....	....	....	....	....	....	62	14	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Maine	13	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	T.
		A.	....	....	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	....	1	1	....	....	....	....	....	10	5	A.
Maryland	31	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	3	20	....	....	....	....	....	....	....	....	....	24	3	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Massachusetts	27	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	T.
		A.	....	....	4	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	2	A.
Michigan	96	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	....	....	....	....	....	....	....	....	....	....	....	5	1	T.
		A.	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	3	5	3	....	....	....	....	15	6	A.
Minnesota	69	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	T.
		A.	....	....	....	2	..	...	6	...	....	3	5	....	....	....	2	....	....	....	2	1	....	6	....	....	1	....	....	....	....	....	....	8	4	A.
Mississippi	45	T.	....	....	....	2	..	...	6	...	....	3	5	....	....	....	2	....	....	....	2	1	....	6	....	....	1	....	....	....	....	....	....	28	9	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Missouri	96	T.	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	2	8	14	42	2	....	....	....	....	....	1	....	....	....	70	7	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Montana	40	T.	....	....	....	....	....	....	....	....	....	....	2	3	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	5	2	T.
		A.	1	....	1	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	3	3	1	....	....	....	1	....	....	....	....	....	6	2	A.
Nebraska	112	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	2	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Nevada	39	T.	1	....	....	....	1	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	2	2	A.
New Hampshire	23	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	T.
		A.	....	....	3	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	6	4	A.
New Jersey	54	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	8	3	....	....	....	....	....	....	....	....	11	2	T.
		A.	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	A.
New Mexico	1	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
New York	93	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	2	1	T.
		A.	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	4	3	A.
North Carolina	60	T.	3	....	....	....	....	2	....	....	....	1	....	....	....	....	....	....	....	5	....	2	4	12	5	....	....	....	....	....	....	....	....	34	8	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
North Dakota	39	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	1	3	....	3	7	6	6	....	....	....	....	31	7	A.
Ohio	140	T.	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	....	20	9	12	1	....	....	....	....	....	....	....	....	44	6	T.
		A.	1	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	1	....	1	....	....	....	....	....	1	....	1	....	....	....	....	7	7	A.
Oklahoma	20	T.	....	....	6	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	9	3	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Oregon	60	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Pennsylvania	93	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	....	....	....	....	....	....	4	....	....	....	....	....	....	....	....	....	0	0	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	2	A.
Rhode Island	6	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	T.
		A.	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
South Carolina	42	T.	3	....	....	....	....	....	....	....	....	....	2	1	....	....	1	1	....	....	1	....	....	3	3	....	1	....	....	....	....	....	....	1	1	T.
		A.	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	16	9	A.
South Dakota	46	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Tennessee	49	T.	1	....	....	....	....	1	....	1	1	....	1	....	....	....	1	....	....	1	....	18	1	2	4	....	1	2	2	....	....	....	....	9	7	T.
		A.	....	....	....	....	....	....	....	....	....	....	2	1	....	....	....	....	....	....	....	12	24	2	....	....	....	....	....	....	....	....	....	63	10	A.
Texas	91	T.	....	....	3	5	....	....	..	....	2	5	1	....	....	3	2	....	....	1	....	....	1	....	....	....	....	....	....	....	....	....	....	0	0	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	23	9	A.
Utah	32	T.	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	A.
Vermont	13	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	T.
		A.	....	....	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Virginia	37	T.	....	....	....	....	....	....	....	....	....	....	....	1	....	....	4	1	....	14	1	4	15	24	3	....	....	1	....	....	....	....	....	5	2	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	68	10	A.
Washington	51	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	5	....	....	....	....	....	....	1	1	A.
West Virginia	37	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9	1	....	1	....	3	14	16	....	....	....	....	....	....	....	....	....	6	2	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	44	6	A.
Wisconsin	58	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	T.
		A.	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	2	4	1	....	....	....	....	0	0	A.
Wyoming	11	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	6	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Sums	2,603	T.	18	1	12	19	13	11	26	4	2	26	31	13	2	4	48	5	1	49	29	201	176	187	18	2	3	2	0	4	....	....	....	907	....	T.
		A.	5	2	30	3	0	0	1	1	1	2	0	0	1	2	1	0	2	0	2	10	4	7	3	4	23	25	16	1	....	....	....	147	....	A.

TABLE X.—*Hourly sunshine as deduced from sunshine recorders, February,* 1897.

Stations.	Instrument.	Percentages for each hour of local mean time ending with the respective hour.																Hours of sunshine.			
		A. M.								P. M.								Total.			
		5	6	7	8	9	10	11	Noon	1	2	3	4	5	6	7	8	Actual.	Possible.	Percent of possible.	Personal estimate.
																		Hours.	*Hours.*		
Albany, N. Y	T.	.....	.....	46	28	46	53	73	79	79	73	68	59	41	34	.....	.....	173.5	295.4	59	36
Atlanta, Ga	T.	.....	.....	28	29	31	38	42	41	42	44	43	32	29	30	.....	.....	112.0	307.1	36	38
Atlantic City, N. J	P.	.....	.....	57	44	48	53	44	48	46	47	46	41	38	43	.....	.....	136.8	300.8	45	38
Baltimore, Md	T.	.....	.....	29	25	29	38	49	47	42	42	45	46	38	39	.....	.....	119.9	300.8	40	33
Binghamton, N. Y	T.	.....	.....	31	25	25	32	42	38	45	50	43	32	26	23	.....	.....	104.7	296.5	35	30
Bismarck, N. Dak	P.	.....	.....	50	34	46	54	60	62	58	59	58	56	46	43	.....	.....	153.2	288.7	53	43
Boston, Mass	T.	.....	.....	59	51	49	54	53	53	55	60	58	53	51	49	.....	.....	158.7	296.5	54	49
Buffalo, N. Y	T.	.....	.....	0	3	18	29	41	54	62	55	41	28	14	18	.....	.....	90.3	295.4	34	33
Charleston, S. C	T.	.....	.....	31	32	34	41	45	50	50	49	45	45	44	40	.....	.....	132.1	308.3	43	43
Chattanooga, Tenn	T.	.....	.....	14	10	12	22	41	44	50	44	44	33	18	23	.....	.....	94.4	305.8	31	35
Cheyenne, Wyo	P.	.....	.....	50	55	58	61	65	63	62	56	60	53	35	33	.....	.....	165.5	298.4	55	42
Chicago, Ill	T.	.....	.....	31	16	24	34	39	43	44	39	36	23	20	19	.....	.....	92.1	296.5	31	29
Cincinnati, Ohio	T.	.....	....	26	21	25	37	40	47	48	41	36	32	32	35	.....	.....	107.6	300.8	36	34
Cleveland, Ohio	T.	.....	.....	10	9	14	17	18	21	25	31	29	26	15	12	.....	.....	59.4	296.5	20	18
Columbus, Ohio	T.	.....	.....	18	7	12	23	38	44	46	48	37	30	25	22	.....	.....	91.7	299.7	31	32
Denver, Colo	P.	.....	.....	47	55	61	65	69	64	55	64	63	56	45	48	.....	.....	176.8	299.7	59	59
Des Moines, Iowa	T.	.....	.....	48	31	32	29	29	38	49	46	45	39	36	40	.....	.....	112.1	296.5	38	35
Detroit, Mich	T.	.....	.. ...	38	19	18	28	44	54	59	45	34	21	22	26	.....	.....	101.2	296.5	34	24
Dodge City, Kans	P.	.....	.....	39	43	55	61	66	63	65	66	64	65	47	41	.....	.....	175.8	302.3	58	54
Dubuque, Iowa	T.	.....	.....	48	32	32	28	39	35	36	34	25	21	21	27	.....	.....	84.6	296.5	29	36
Eastport, Me	P.	.....	.....	38	40	58	69	79	71	58	61	56	50	44	36	.....	.....	168.0	291.9	58	50
Eureka, Cal	P.	.....	.....	41	32	32	39	33	36	42	47	42	39	26	24	.....	.....	105.3	298.4	35	34
Fresno, Cal	T.	.....	.. ...	62	43	49	60	61	64	66	70	66	67	51	36	.....	.....	177.2	303.3	58	50
Galveston, Tex	P.	.....	.....	16	48	56	55	54	55	56	54	57	54	42	21	.....	.....	155.0	313.1	50	45
Helena, Mont	P.	.....	.....	31	20	25	43	53	46	50	50	50	36	35	40	.....	.....	118.6	288.7	41	39
Idaho Falls, Idaho	T.	.....	.....	4	7	18	39	64	75	72	70	59	30	15	16	.....	.....	128.0	295.4	43	17
Indianapolis, Ind	T.	.....	.....	37	29	43	59	68	68	69	64	56	49	33	20	.....	.....	154.7	299.7	52	36
Kansas City, Mo	P.	.....	.....	31	12	31	35	38	39	42	42	39	30	26	43	.....	.....	102.2	300.8	34	30
Little Rock, Ark	T.	.....	.....	35	29	36	48	49	49	53	62	66	63	45	38	.....	.....	149.9	305.8	49	33
Los Angeles, Cal	P.	.....	.....	54	56	67	69	74	69	68	69	64	67	54	54	.....	.....	198.1	307.1	65	58
Louisville, Ky	T.	.....	.....	26	28	31	36	49	54	50	47	41	31	25	27	.....	.....	115.9	302.3	38	28
Minneapolis, Minn	T.	.....	.....	48	24	22	26	33	33	33	33	33	30	14	14	.....	... ..	81.0	291.9	28	.....
Nashville, Tenn	T.	.....	.....	40	28	39	55	55	56	52	49	48	47	40	39	.....	... ..	141.1	305.0	46	40
New Orleans, La	T.	.....	.....	11	5	7	21	35	39	39	35	35	23	14	14	.....	.....	75.0	312.1	24	24
New York, N. Y	T.	.....	.....	47	36	50	60	65	73	68	66	59	50	39	26	.....	.....	164.2	298.4	55	36
Northfield, Vt	P.	.....	.....	38	41	45	58	62	55	50	45	48	44	34	24	.....	.....	138.2	293.8	47	34
Omaha, Nebr	P.	.....	.....	29	21	32	46	54	57	55	61	58	45	31	30	.....	.....	134.4	298.4	45	34
Philadelphia, Pa	T.	.....	.....	63	40	49	58	68	71	71	66	62	61	46	44	.....	.....	174.7	299.7	58	36
Phœnix, Ariz	P.	.....	.....	54	57	76	81	78	72	73	75	77	76	54	54	.....	.....	216.8	308.3	70	63
Pittsburg, Pa	T.	.....	.....	32	11	12	20	31	35	38	36	37	33	28	26	.....	.....	84.0	298.4	28	24
Portland, Me	T.	.....	.....	54	41	60	71	79	81	82	79	74	59	45	37	.....	.....	193.4	293.8	66	50
Portland, Oreg	T.	.....	.....	11	8	10	24	31	40	39	31	27	21	15	18	.....	.....	71.3	290.4	25	29
Do	P.	.. ...	.....	11	8	10	26	29	23	30	24	25	19	13	18	.....	.....	60.1	290.4	21	29
Raleigh, N. C	T.	...	.....	29	30	48	56	59	66	71	68	61	49	41	31	.....	.....	161.5	305.0	53	40
Rochester, N. Y	T.	.....	.....	8	7	12	24	31	40	46	42	36	24	20	27	.....	. ....	83.1	295.4	28	25
St. Louis, Mo	T.	.....	.....	29	25	36	46	56	61	59	61	51	48	39	40	.....	.....	143.5	300.8	48	30
St. Paul, Minn	P.	.....	.....	43	21	26	31	29	29	30	26	24	27	13	9	.....	.....	73.0	291.9	25	25
Salt Lake City, Utah	P.	.....	.....	36	21	33	35	39	39	37	38	28	31	24	19	.....	.....	94.8	298.4	32	17
San Diego, Cal	P.	.....	.....	59	55	62	67	74	69	69	71	70	65	68	63	.....	.....	205.1	308.3	67	54
San Francisco, Cal	T.	.....	.....	37	32	37	51	54	70	73	69	65	53	39	18	.....	.....	154.4	302.3	51	43
Santa Fe, N. Mex	P.	.....	.....	47	59	71	70	72	62	64	66	59	51	43	38	.....	.....	182.7	305.0	60	46
Savannah, Ga	P.	.....	.....	26	30	37	42	38	38	32	44	40	39	21	17	.....	.....	106.6	309.8	34	35
Seattle, Wash	T.	.....	.....	15	8	12	25	41	47	55	48	49	34	10	6	.....	.....	92.6	286.8	32	28
Spokane, Wash	P.	.....	.....	31	21	24	24	32	29	35	35	37	41	27	11	.....	.....	83.2	286.8	29	26
Tampa, Fla	T.	.....	.....	36	29	42	61	76	82	83	85	79	61	51	60	.....	.....	198.9	314.1	63	58
Vicksburg, Miss	T.	.....	.....	24	30	36	46	66	75	74	70	63	53	46	37	.....	.....	166.5	309.8	54	52
Washington, D. C	P.	.....	.....	43	39	43	41	46	46	47	45	42	45	40	43	.....	.....	130.9	300.8	44	39
Wilmington, N. C	T.	.....	.....	29	29	38	48	57	64	69	68	65	52	38	22	.....	.....	153.8	307.1	50	46

TABLE XI.—*Accumulated amounts of precipitation for each 5 minutes, for rains in which the rate of fall equaled or exceeded 0.25 in any 5 minutes, or 0.75 in 1 hour during February, 1897, at all stations furnished with self-registering gauges.*

Station.	Date.	Total duration.	Total precipitation.	Amount before excessive rate began.	Accumulated amounts (in inches) during periods of time as indicated.															
					5 min.	10 min.	15 min.	20 min.	25 min.	30 min.	35 min.	40 min.	45 min.	50 min.	60 min.	80 min.	100 min.	120 min.	140 min.	160 min.	180 min.
		h. m.	Inches.	Inches.																
Atlanta, Ga	22-23	2 00	0.56	0.05	0.21	0.25	0.41	0.45	.....	.....	....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....
Baltimore, Md.*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bismarck, N. Dak.†	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boston, Mass	12-13	.....	0.88	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.21	.....	.....	.....	.....	.....	.....
Buffalo, N. Y	5-6	.....	1.58	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.19	.....	.....	.....	.....	.....	.....
Chicago, Ill.*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cincinnati, Ohio	20	4 25	0.55	0.04	0.05	0.18	0.27	0.40	0.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cleveland, Ohio	5-6	.....	0.81	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.16	.....	.....	.....	.....	.....	.....
Denver, Colo.†	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Des Moines, Iowa	21-22	.....	0.41	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.11	.....	.....	.....	.....	.....	.....
Detroit, Mich	5-6	.....	0.34	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.06	.....	.....	.....	.....	.....	.....
Dodge City, Kans.†	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Duluth, Minn.†	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eastport, Me.†	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Galveston, Tex	10-11	14 05	1.11	0.05	0.05	0.12	0.24	0.35	0.50	0.62	0.70	0.79	0.87	0.91	.....	.....	.....	.....	.....	.....	.....
Hatteras, N. C	1-2	.....	0.95	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.46	.....	.....	.....	.....	.....	.....
Indianapolis, Ind	19-20	.....	0.46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.18	.....	.....	.....	.....	.....	.....
Jacksonville, Fla	11-12	.....	1.86	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.46	.....	.....	.....	.....	.....	.....
Jupiter, Fla	11	6 10	2.61	0.65	0.09	0.26	0.55	0.80	0.93	1.07	1.15	1.29	1.41	1.46	1.74	1.81	.....	.....	.....	.....	.....
Kansas City, Mo.†	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Key West, Fla	5-6	2 30	0.96	0.05	0.06	0.15	0.27	0.38	0.45	0.52	0.57	0.61	0.65	0.68	0.72	.....	.....	.....	.....	.....	.....
Little Rock, Ark.*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Louisville, Ky.*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Memphis, Tenn	4-5	.....	1.66	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.30	.....	.....	.....	.....	.....	.....
Milwaukee, Wis.*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Montgomery, Ala.*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nantucket, Mass	22-23	.....	0.38	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.20	.....	.....	.....	.....	.....	.....
Nashville, Tenn	1	.....	1.18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.55	.....	.....	.....	.....	.....	.....
New Orleans, La	4-5	.....	1.64	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.55	.....	.....	.....	.....	.....	.....
New York, N. Y	22-23	.....	0.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.25	.....	.....	.....	.....	.....	.....
Norfolk, Va	23	.....	0.44	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.31	.....	.....	.....	.....	.....	.....
Omaha, Nebr.*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philadelphia, Pa	22-23	.....	0.71	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.28	.....	.....	.....	.....	.....	.....
Pittsburg, Pa.*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portland, Me	7	....	0.60	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.15	.....	.....	.....	.....	.....	.....
Portland, Oreg.	10-11	.....	0.92	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.26	.....	.....	.....	.....	.....	.....
Rochester, N. Y	5-6	.....	0.88	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.13	.....	.....	.....	.....	.....	.....
St. Louis, Mo	21	.....	1.36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.33	.....	.....	.....	.....	.....	.....
St. Paul, Minn	20	.....	0.18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.08	.....	.....	.....	.....	.....	.....
Salt Lake City, Utah	5-6	.....	0.90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.35	.....	.....	.....	.....	.....	.....
San Diego, Cal	20	6 10	0.85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.50	.....	.....	.....	.....	.....	.....
San Francisco, Cal	Jan.31-1	.....	1.62	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.34	.....	.....	.....	.....	.....	.....
Savannah, Ga	1	5 25	1.42	0.41	0.06	0.09	0.13	0.14	0.21	0.26	0.30	0.35	0.43	0.68	0.76	0.91	0.98	.....	.....	.....	.....
Seattle, Wash	4-5	.....	0.41	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.15	.....	.....	.....	.....	.....	.....
Tampa, Fla	5	5 00	3.10	0.10	0.10	0.30	0.47	0.60	0.68	0.75	0.78	0.80	0.85	0.90	1.05	1.28	1.61	1.79	‡	.....	.....
Vicksburg, Miss	7	2 10	0.42	0.05	0.20	0.32	0.34	0.36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington, D. C	22-23	.....	0.67	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.32	.....	.....	.....	.....	.....	.....
Wilmington, N. C.*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*Self register out of order. †No record, on account of snow. ‡Gauge overflowed.

TABLE XII.—*Excessive precipitation, by stations, for February*, 1897.

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Alabama.	*Inches.*	*Inches.*		*Ins.*	*h.m.*	
Alco	13.53	5.32	11			
Bermuda		2.90	11			
Brewton	12.30	5.00	11			
Daphne		2.50	24-25			
Eufaula		4.05	10-11			
Evergreen		4.40	10-11			
Healing Springs	12.05	5.23	10-11			
Mobile				1.00	1 00	5
Mount Willing		4.02	11			
Newton	10.44	4.04	11			
Selma		3.32	10-11			
Sturdevant		2.71	23-24			
Thomasville	11.70	7.40	10-11			
Union Springs	10.01	5.10	10-11			
Arkansas.						
Blackton				2.25	2 00	4
California.						
Azusa	10.38	3.25	1			
Do		3.25	18			
Bear Valley	16.05	2.60	1			
Do		2.85	5			
Bowmans Dam	18.31	2.77	1			
Do		3.09	5			
Do		2.50	16			
Do		2.67	19			
Castle Pinckney		3.07	1			
Crescent City	15.31	3.65	5			
Edmanton	13.80					
Eureka	11.33					
Folsom City		2.51	1-2			
Fordyce Dam	14.92	2.65	1			
Do		2.77	5			
Fort Bragg	10.31	2.80	4			
Fort Ross	11.49					
Georgetown	18.26	2.75	2			
Do		3.00	5			
Grass Valley	14.75	4.60	1			
Hueneme		3.12	1			
Iowa Hill	15.83	2.88	5			
Kennedy Gold Mine	13.06	2.98	5			
Laporte	17.92	4.03	1			
Do		2.97	5			
Las Fuentes Ranch		3.05	1			
Malakoff Mine	16.57	4.46	1			
Nevada City	13.63	3.88	1			
Nordhoff		3.25	1			
North San Juan	13.70	3.60	1			
Oleta	14.44	2.50	4			
Oroville		2.75	1			
Pilot Creek	19.12	3.82	1			
Do		3.80	5			
Do		2.70	16			
Placerville	14.61	2.79	1			
Quincy		2.88	1			
Represa		3.64	1			
Sierra Madre		2.77	1			
Summerdale	17.66	8.38	1-2			
Ukiah	10.35	2.73				
Upper Mattole	17.86	8.53	4-5			
Westpoint	14.15					
Florida.						
Archer		2.68	12			
Brooksville		2.63	12			
Clermont		3.85	5			
Defuniak Springs	12.25	3.50	11			
Earnestville		3.85	5			
Eustis		3.95	5			
Haywood		2.50	15			
Jupiter		2.61	1	1.84	1 06	1
Kissimmee		3.12	1			
Lake Butler		4.87	11-13			
Lake City	12.79	5.43	11-13			
Macclenny		4.77	11-13			
Milton	13.23					
Pensacola	10.26	4.37	10-11			
Plant City		2.78	5			
Quincy	12.40					
St. Francis		3.75	5			
Tallahassee	10.45					
Tampa		3.10	5	1.05	1 00	5
Georgia.						
Allentown		2.54	10-11			
Augusta		3.25	5-6			
Brag		2.70	5			
Dublin		3.13	10-11			
Fleming		3.10	25			
Hephzibah		3.70	5			
Jesup	12.43	3.02	15-16			
Do		2.96	24-25			
Leverett		2.50	5			
Lumpkin	10.18	3.96	10-11			
Macon		2.50	24-25			
Marshallville		3.10	12			
Milledgeville		2.71	11-12			
Millen		2.95	6			
Piscola	10.40					
Quitman	10.73	3.50	11-12			
Reynolds		2.80	10-11			
Savannah		2.66	24-25			
Thomasville	14.17	2.55	11			

TABLE XII.—*Excessive precipitation*—Continued.

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Georgia—Continued.	*Inches.*	*Inches.*		*Ins.*	*h.m.*	
Thomasville		2.87	15			
Indiana.						
Jasper		3.00	21-22			
Madison		3.35	21-22			
Salem		2.99	21-22			
Scottsburg		2.75	21-22			
Kentucky.						
Burnside		2.73	20-21			
Carlisle				1.00	1 00	1
Carrollton		4.47	21-22			
Edmonton		3.00	21			
Eubank		3.44	21-22			
Falmouth		3.06	21-22			
Leitchfield		2.80	20-21			
Middlesboro		2.58	20-21			
Southfork		3.35	21			
Vanceburg		2.70	22			
Williamsburg		2.75	20-21			
Louisiana.						
Donaldsonville		3.70	16			
Jeanerette		2.56	15			
Liberty Hill		2.60	4			
Melville		3.90	10-11			
New Iberia		2.88	15			
Robeline		2.90	5			
Venice		4.02	15			
White Hall		2.87	15			
Maryland.						
Bachmans Valley		2.60	23			
Cumberland		2.70	22-23			
Mississippi.						
Bay St. Louis		3.10	5			
Magnolia		3.23	10-11			
Mosspoint		4.10	4			
Poplarville		2.65	4-5			
Water Valley				1.00	0 10	22
Missouri.						
Booneville		3.60	1			
Grovedale		2.78	21			
Hastain		3.00	3-4			
Montreal		2.50	21			
Springfield				1.20	0 40	21
New Jersey.						
Charlotteburg		3.26	6-7			
North Carolina.						
Horse Cove		2.98	1			
Do		2.57	5			
Kittyhawk		2.60	20-21			
Lenoir		3.25	5-6			
Linville	10.23	3.04	6			
Louisburg				1.06	1 00	6
Lynn		3.03	5-6			
Morganton		2.80	5			
Ohio.						
Atwater		2.85	6			
Cherry Fork		3.25	21-22			
Coalton		3.37	21-22			
Frankfort		2.80	21-22			
New Waterford		2.50	5-6			
Portsmouth		3.24	22			
Vanceburg		2.60	21-22			
Waverly		2.28	21-22			
Oregon.						
Astoria	12.89					
Bay City	14.69					
Cascade Locks	14.37					
Falls City	12.67					
Gardiner	14.77	2.80	5			
Glenora	20.90	4.41	11			
Do		4.11	15			
Langlois	16.51	3.10	5			
Nehalem	17.97	3.06	10			
Do		3.52	14			
Newport	14.16					
Toledo	17.46	2.63	15			
Pennsylvania.						
Duncannon		3.20	2			
South Carolina.						
Blackville		2.95	6			
Camden		2.60	5-6			
Columbia		2.71	5-6			
Edisto		2.89	5-6			
Georgetown	10.50	2.70	1			
Greenville		2.71	5-6			
Greenwood		2.90	5-6			
Little Mountain		3.50	5-6			
Longshore		3.12	5-6			
Santuc		3.39	5-6			
Shaws Fork		3.15	5-6			
Spartanburg		3.50	5-6			
Trial		2.58	5-6			
Yemasse	10.20					
Yorkville		2.86	5-6			
Tennessee.						
Bristol		3.10	20			
Do		2.82	22			
Byrdstown		2.59	20-21			
Chattanooga				1.13	0 25	22
Clinton		3.50	22-23			
Liberty		2.52	5-6			

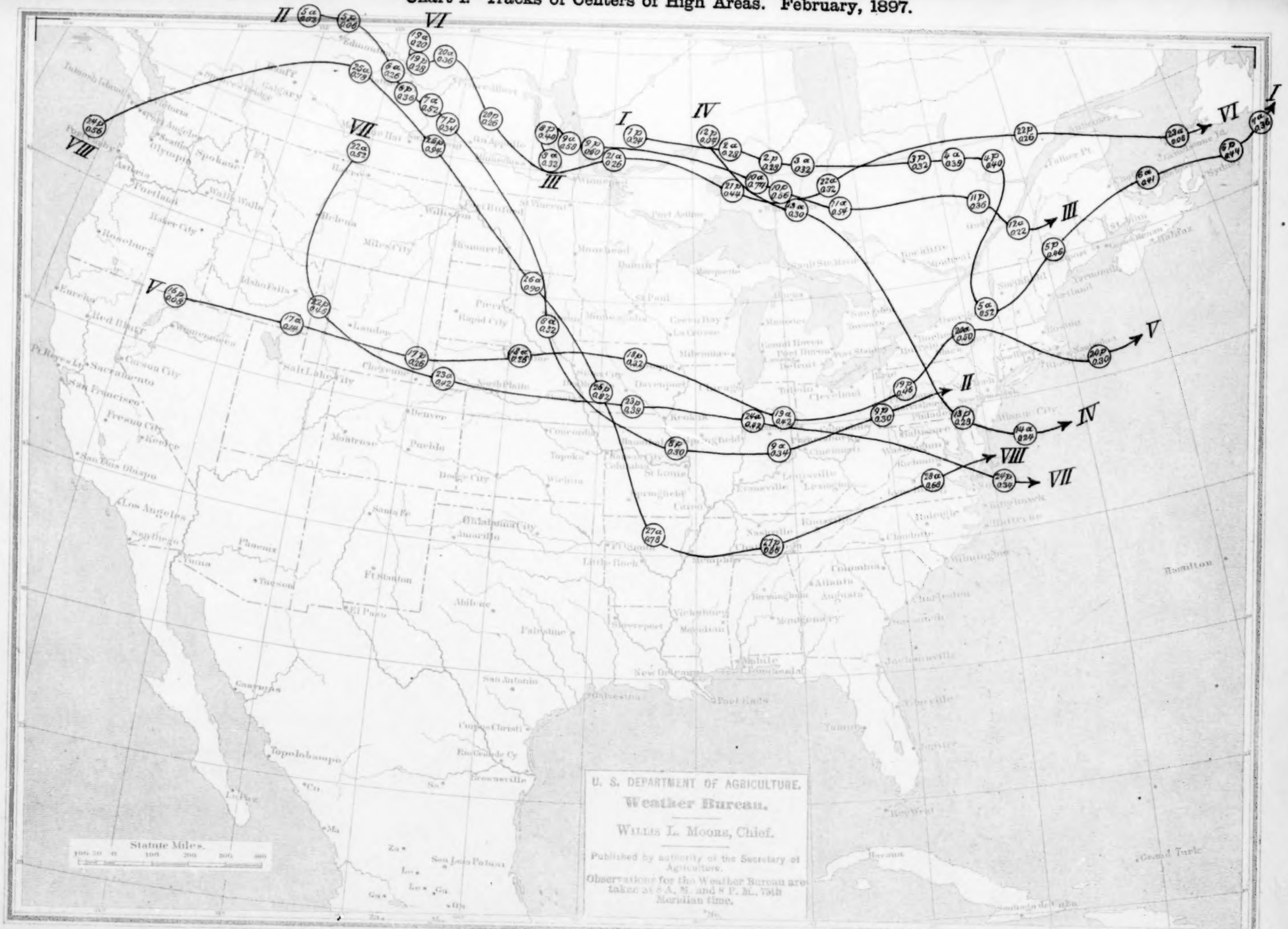
TABLE XII.—*Excessive precipitation*—Continued.

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Virginia.	*Inches.*	*Inches.*		*Ins.*	*h.m.*	
Burkes Garden		2.50	21			
Fredericksburg		2.92	2			
Grahams Forge		2.70	5-6			
Guinea		2.57	22			
Hot Springs		3.20	5-6			
Lynchburg		2.53	5-6			
Maidens		3.02	22			
Manassas		3.50	2			
Marion		2.50	20-21			
Rockymount		2.80	5-6			
Speers Ferry		3.30	20-21			
Wytheville		2.55	6			

TABLE XII.—*Excessive precipitation*—Continued.

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Washington.	*Inches.*	*Inches.*		*Ins.*	*h.m.*	
Cascade Tunnel	11.30					
Fort Canby	10.24					
North Bend	10.05	3.13	15			
South Bend	10.30					
Tatoosh Island	11.16					
West Virginia.						
Beverly		4.25	21-22			
Burlington		2.70	22			
Elkhorn		3.00	20-21			
Glenville		3.17	22-23			
Nuttallburg		3.05	21-22			
Phillippi		3.50	21-22			

Chart I. Tracks of Centers of High Areas. February, 1897.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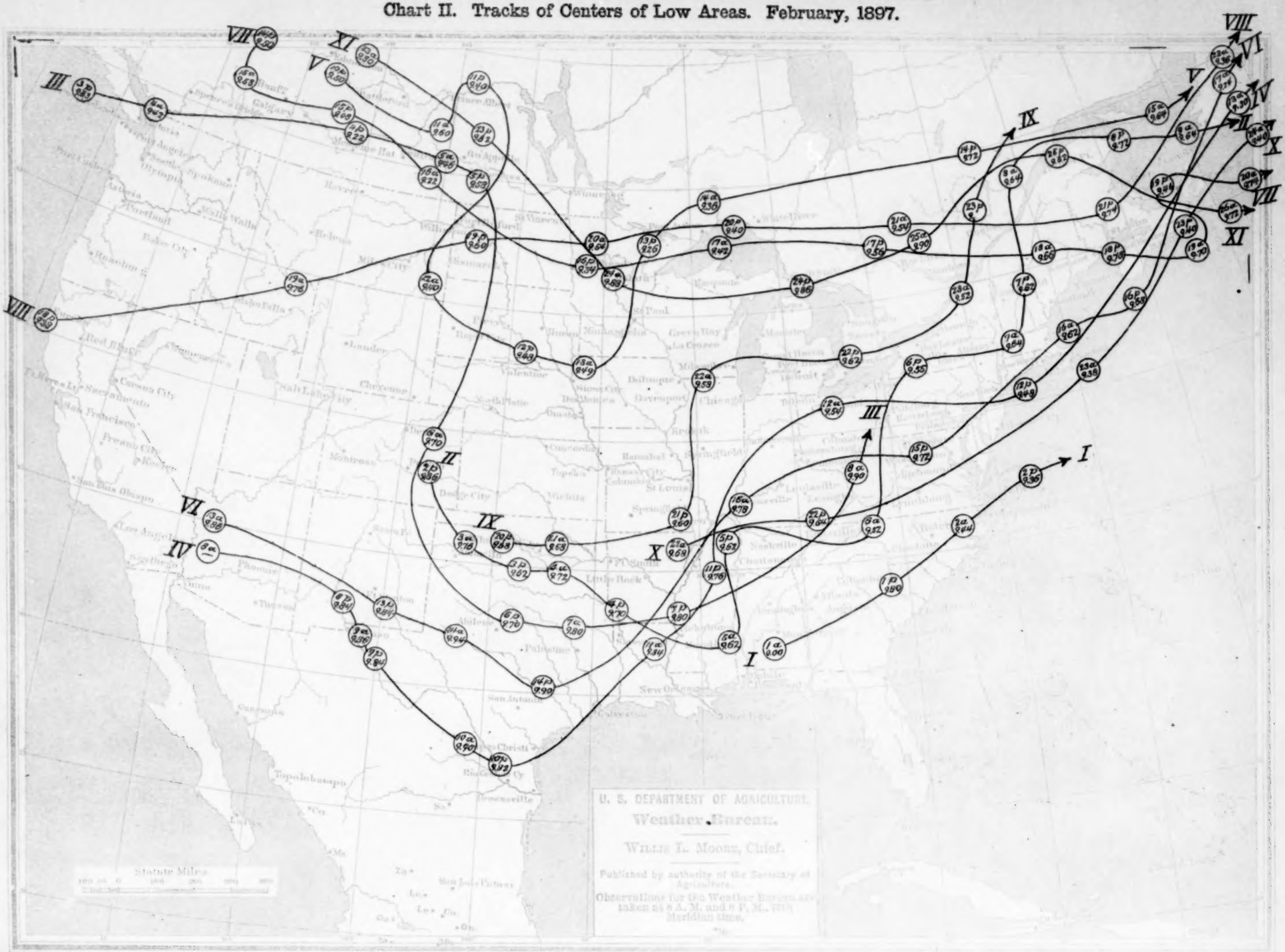
Observations for the Weather Bureau are taken at 8 A. M. and 8 P. M., 75th Meridian time.
Statute Miles.

Chart II. Tracks of Centers of Low Areas. February, 1897.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Statute Miles

Chart III. Total Precipitation. February, 1897.

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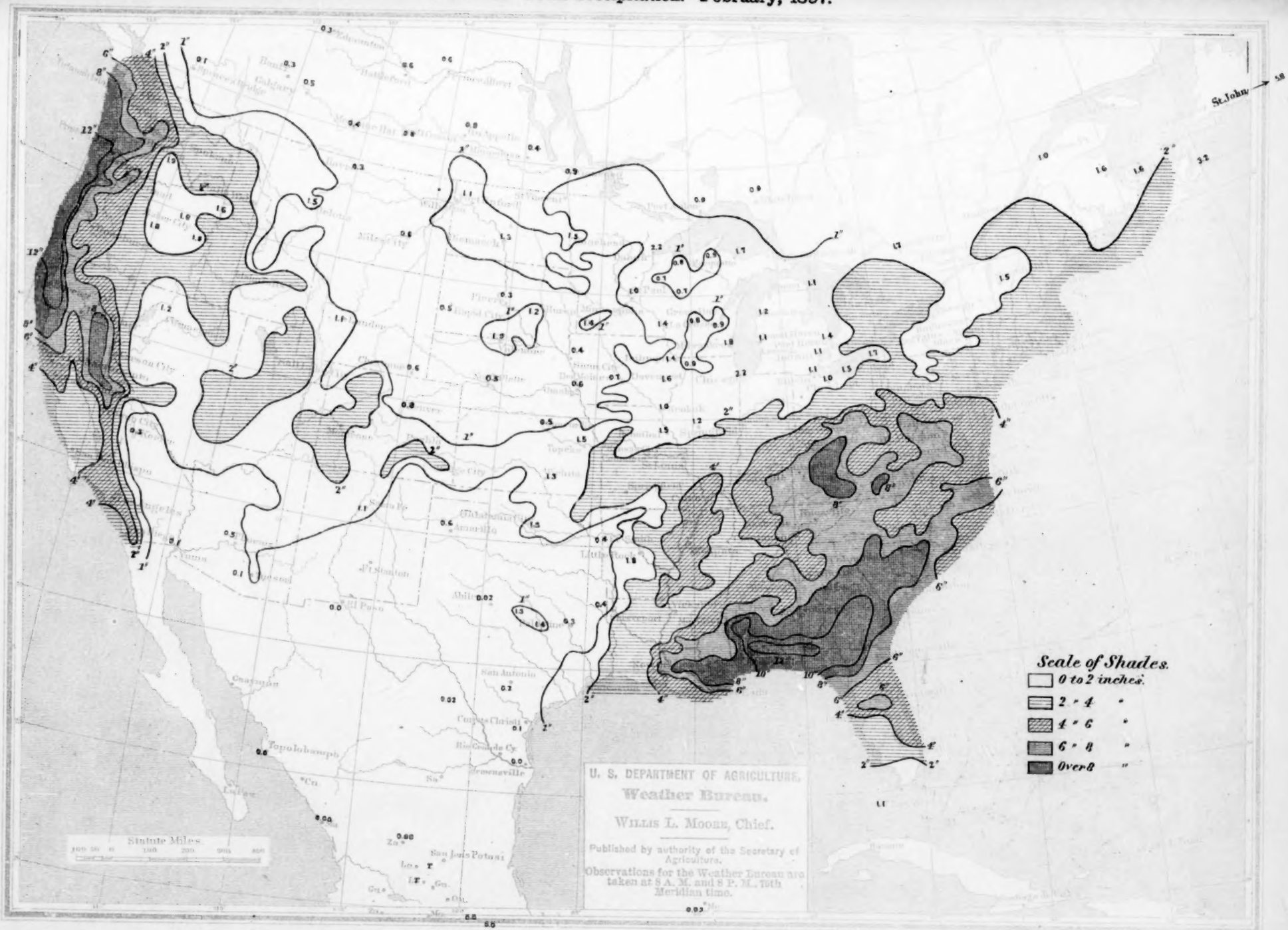
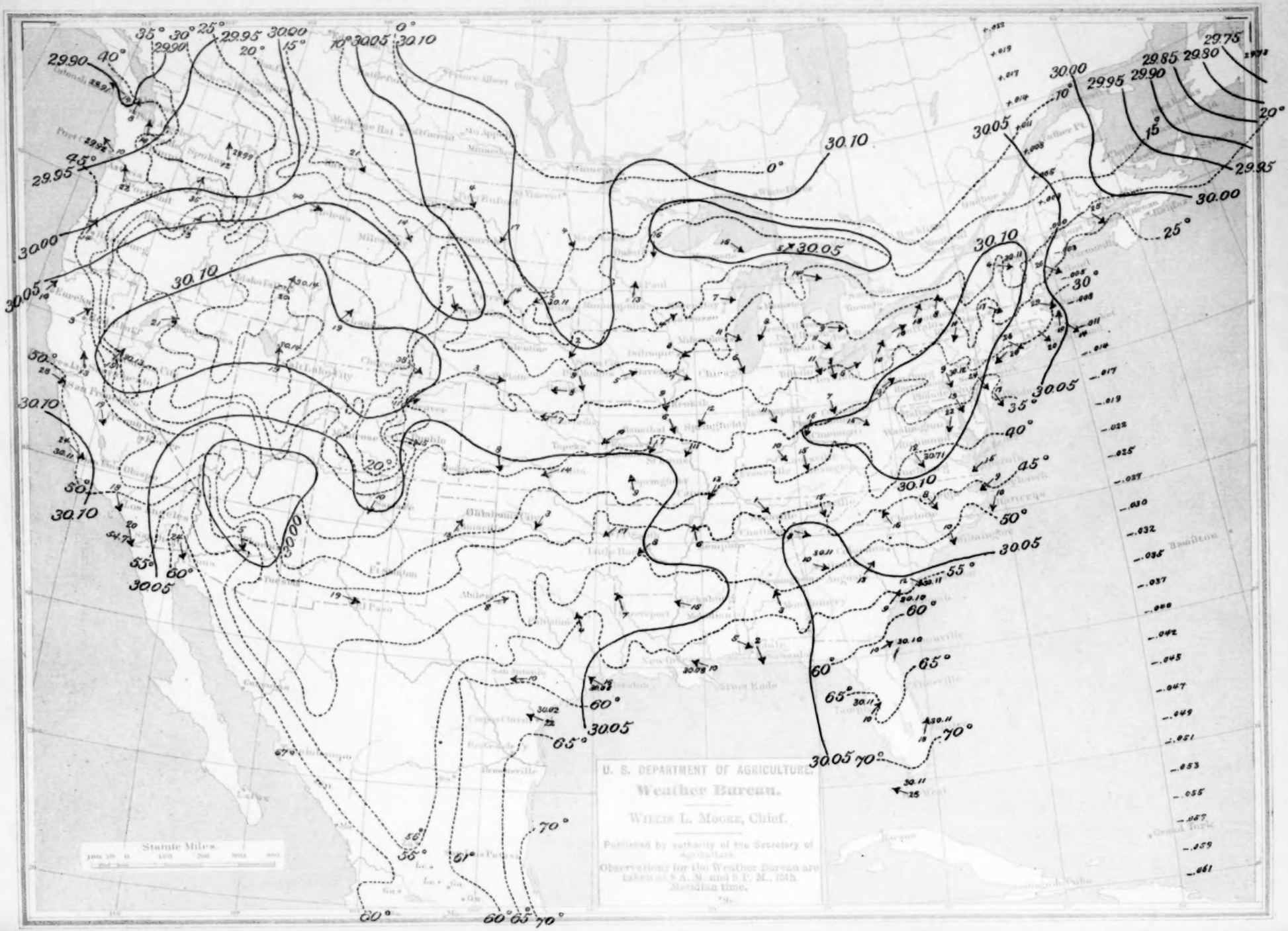


Chart IV. Isobars, Isotherms, and Resultant Winds. February, 1897.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Statute Miles

Chart V. Depth of Snowfall and Limits of Freezing Weather. February, 1897.

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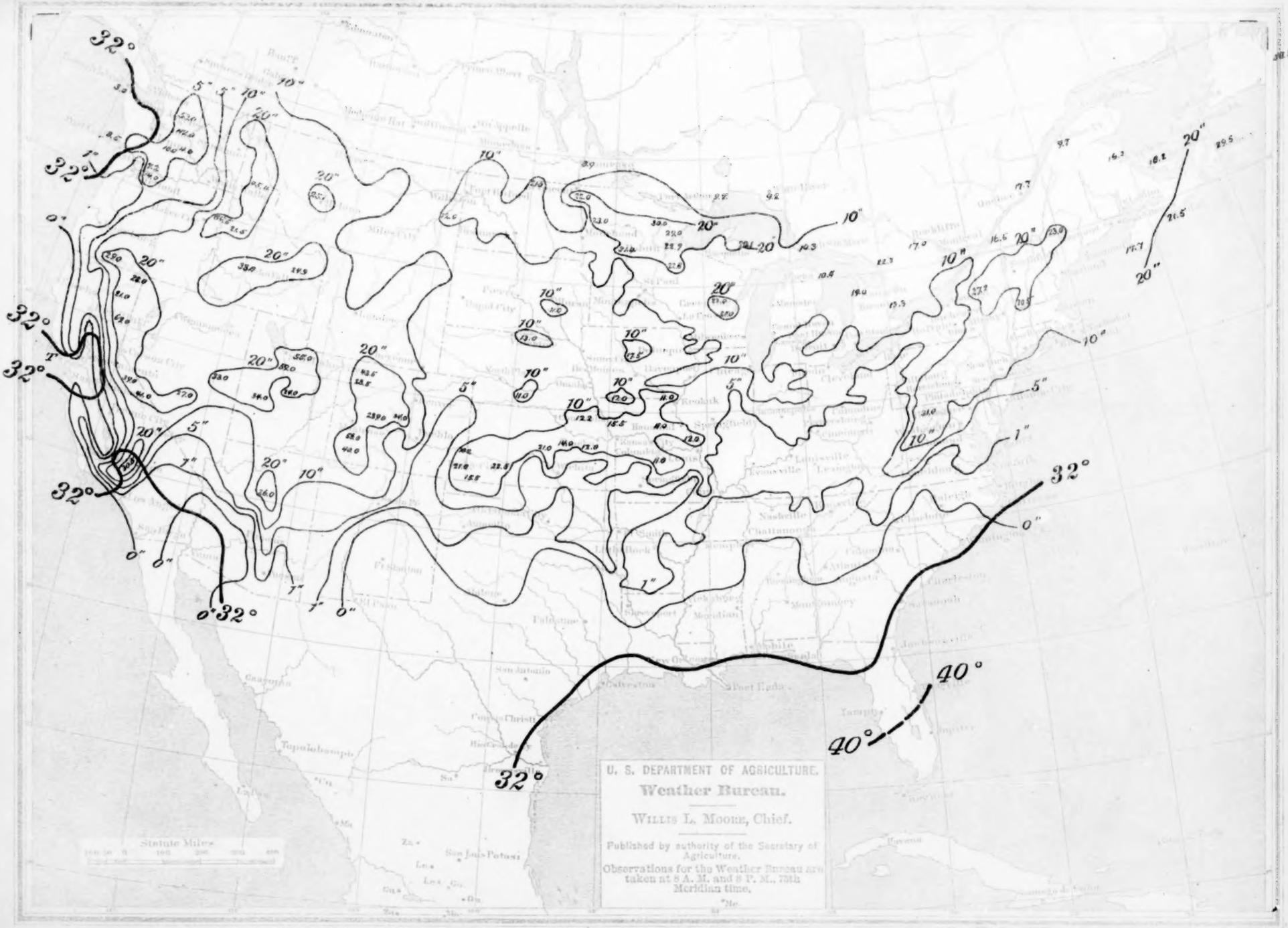

Chart VI. Depth of Snow on Ground at the Close of the Month. February, 1897.

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Statute Miles
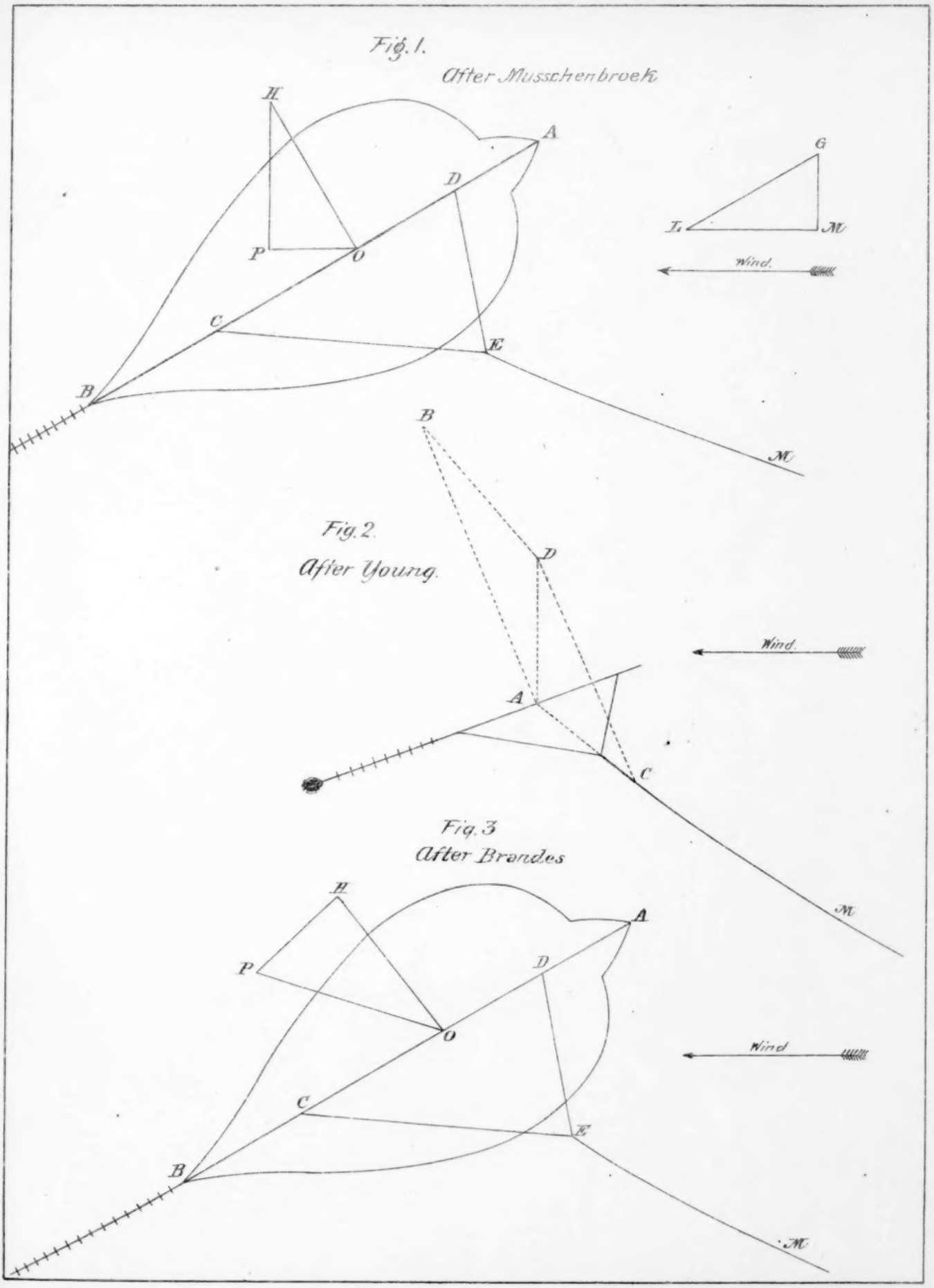
Chart VII. Illustrating the Mechanics of the Kite.